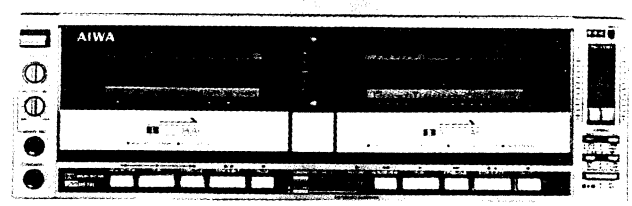
SERVICE MANUAL

MODEL NO.

AD-WX110

STEREO CASSETTE DECK



Code No. 04-110-000-58

TYPE. H, HU, E, K, G

DATE OF ISSUE 9/1982

SPECIFICATION

GENERAL

Semiconductors:	9ICs, 135 transistors, 29 diodes, 26 LED
Power source:	**H, HU models** AC120V/220V/240V Switchable 50/60 Hz **E model** AC220V, 50/60 Hz **K, G models** AC240V, 50/60 Hz
Power consumption:	25W
Dimensions:	330 (W) x 107 (H) x 306 (D) mm
Weight:	5.2kg
Track type:	4 track 4 channel
Tape speed:	4.8cm/s. ± 1.5% 9.5cm/s. (at dubbing)
Wow and flutter:	Less than 0.045% (WRMS)
Automatic stop system:	Full auto stop
Automatic shut-off action time:	Less than 5s.
Pinch roller pressure:	125 ± 15g (1.23 ± 0.15N)
Take-up torque:	$35 \pm {}^{+15}_{-5}$ g-cm ($0.34 \pm {}^{+0.15}_{-0.049}$ mN·m)
FF & rewind torque:	110 ± 20g-cm (1.078 ± 0.2mN·m)
FF & rewind time:	90 ± 5s. (C-60)
Back tension:	2.5 ± 1g-cm (0.025 ± 0.0098mN·m)
Counter indication error:	0 ± 2.5
Playback output: (TTA-161)	540 ± 50mV (LINE)
Playback noise:	Less than 1mV (CrO_2, DOLBY B NR ON) Less than 2.6mV (LH, DOLBY B NR OFF)
REC/PB output:	OVU $^{+1.5}_{-0.5}$dB
REC/PB distortion: (400 Hz, 0VU)	Less than 1.5% (LINE IN, REC/PB, METAL, CrO_2, LH) Less than 2.5% (Back side dubbing, METAL, CrO_2, LH)
REC/PB SN ratio: (400 Hz, 0VU) (Un weighted)	More than 45/52 dB (METAL, CrO_2, DOLBY C NR OFF/ON) More than 43/50 dB (LH, DOLBY NR C OFF/ON)
(WTD-A)	More than 47/62 dB (METAL, CrO_2, DOLBY C NR OFF/ON) More than 45/60 dB (LH, DOLBY C NR OFF/ON)
Channel separation: (1 kHz, 0VU)	More than 35 dB
Cross talk: (1 kHz, 0VU)	More than 45 dB
Erasing ratio: (METAL, 125 Hz)	More than 60 dB (Front side) More than 55 dB (Rear side)
Level drift: (10 kHz, 0VU)	Less than ±1 dB
Bias frequency:	100 kHz
Dubbing frequency/Sensitivity:	REC/PB input (LINE), Normal-speed dubbing (Front side) 0 ± 2.5 dB (12.5 kHz/1 kHz, DOLBY NR OFF) 0 ± 1.5 dB (at 1 kHz) Duble-speed dubbing (Front side) +0.5 ± 3.0 dB (12.5 kHz/1 kHz, DOLBY NR OFF) 0 ± 2.0 dB (at 1 kHz) Duble-speed dubbing (Rear side) +0.5 ± 3.0 dB (12.5 kHz/1 kHz, DOLBY NR OFF) 0 ± 2.0 dB (at 1 kHz)
Frequency response:	METAL : 20 ~ 18,000 Hz CrO_2 : 20 ~ 17,000 Hz LH : 20 ~ 16,000 Hz
Motor:	DC servomotor
Heads:	Playback head: SH head Record/playback head: SH head Erase head: Double-gap ferrite head x 2
Inputs:	MIC maximum input sensitivity: 0.3 mV (200Ω–10kΩ matched) LINE IN maximum input Sensitivity: 50mV (OVER 50kΩ)
Outputs:	LINE OUT standard output level: 360mV (OVU); suitable load impedance: OVER 50kΩ; Headphones: 8Ω

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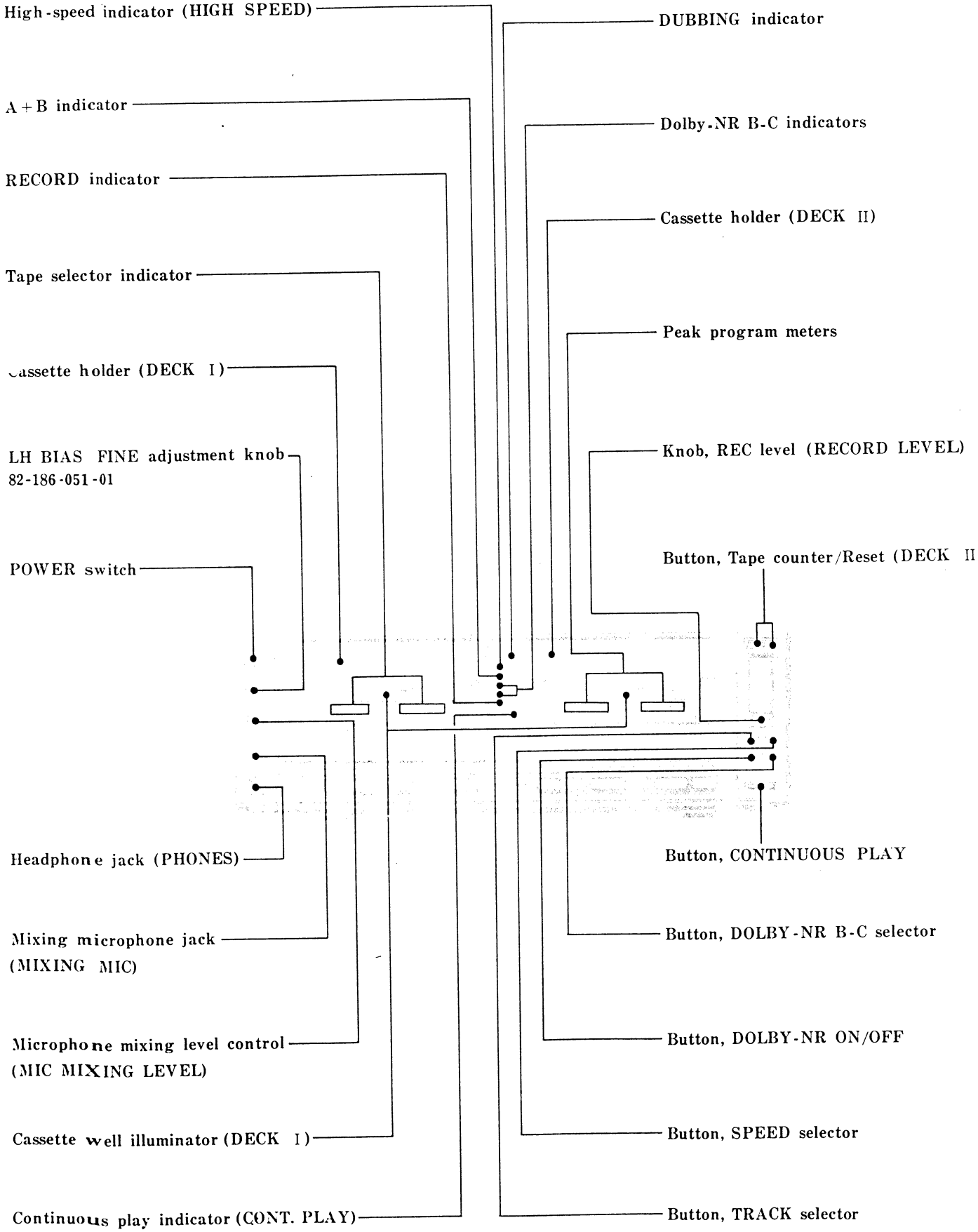
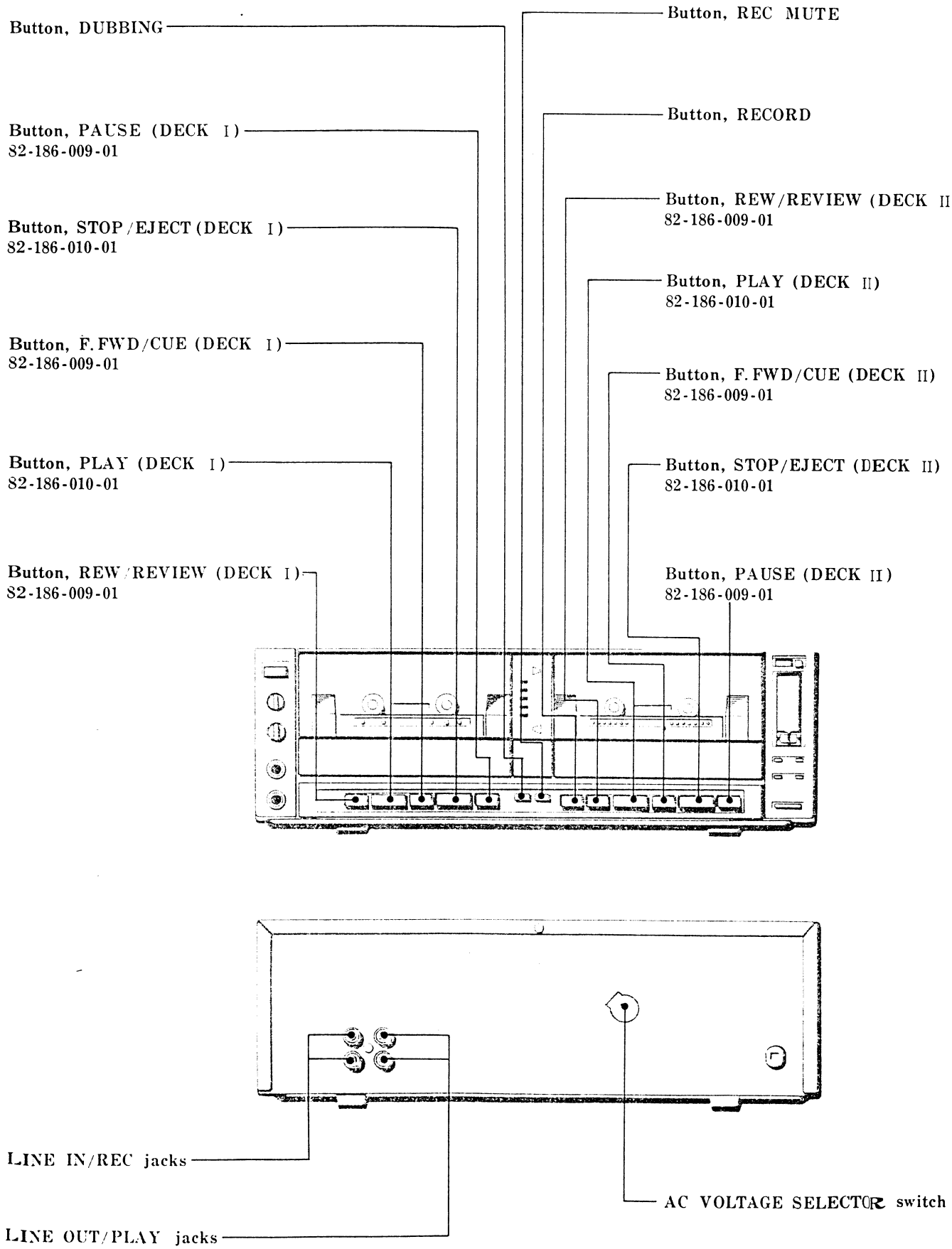
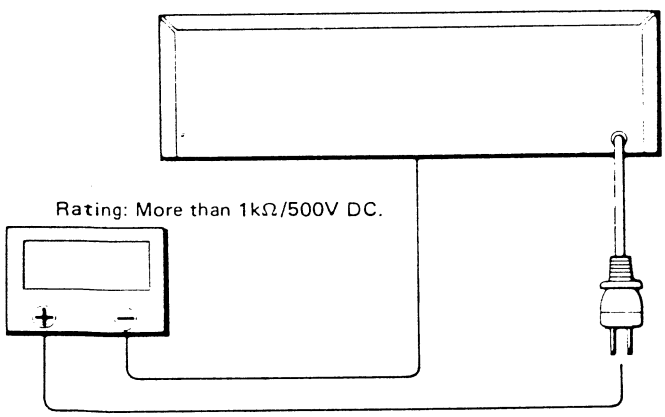
DETECTION


High-speed indicator (HIGH SPEED)
A+B indicator
RECORD indicator
Tape selector indicator
Cassette holder (DECK I)
LH BIAS FINE adjustment knob
82-186-051-01
POWER switch
Headphone jack (PHONES)
Mixing microphone jack
(MIXING MIC)
Microphone mixing level control
(MIC MIXING LEVEL)
Cassette well illuminator (DECK I)
Continuous play indicator (CONT. PLAY)
DUBBING indicator
Dolby-NR B-C indicators
Cassette holder (DECK II)
Peak program meters
Knob, REC level (RECORD LEVEL)
Button, Tape counter/Reset (DECK II)
Button, CONTINUOUS PLAY
Button, DOLBY-NR B-C selector
Button, DOLBY-NR ON/OFF
Button, SPEED selector
Button, TRACK selector


Button, DUBBING
Button, REC MUTE
Button, RECORD
Button, PAUSE (DECK I)
82-186-009-01
Button, REW/REVIEW (DECK II)
82-186-009-01
Button, STOP/EJECT (DECK I)
82-186-010-01
Button, PLAY (DECK II)
82-186-010-01
Button, F.FWD/CUE (DECK I)
82-186-009-01
Button, F.FWD/CUE (DECK II)
82-186-009-01
Button, PLAY (DECK I)
82-186-010-01
Button, STOP/EJECT (DECK II)
82-186-010-01
Button, REW/REVIEW (DECK I)
82-186-009-01
Button, PAUSE (DECK II)
82-186-009-01
LINE IN/REC jacks
AC VOLTAGE SELECTOR switch
LINE OUT/PLAY jacks

Follow the instructions carefully, which will allow the user to optimise the products' performance and give many years of serivce.

1. **No scratch and melting shall be made to covered lead-wires of an a.c. primary circuit including mains leads.**
2. **No illegibility shall be given to the specification plate, the caution labels, the fuse labels and others.**
3. **When, on pattern sides of circuit boards, additional repair-parts have been made up, the parts shall be firmly glued to circuit boards or other components, unless the parts can be attached firmly.**
4. **The following matters shall be maintained as they are, when repairing.**
   1) Soldering of lead-wire ends
      * Care should be taken of the space distance in an a.c. primary circuit as well as soldering.
   2) Wiring and holding of lead-wires with wire-clips and binders
   3) Materials of lead-wires
      * e.g.; For UL models, lead-wires to be used shall be approved or accepted by the UL.
   4) Location of all kinds of insulators
   5) Setting of voltage selector switch
      * Set the Voltage Selector Switch to 240V, 220V, or 120V, According to your Local Voltage.
5. **After repaired, the insulation resistance or leakage current shall be measured with 500 ± 5V D.C and shall be not less than 1MΩ.**
   Measuring points:



6. **General instructions for mechanism repair**
   1) The heads, capstan and pinch roller shall be cleaned of good quality alcohol after repaired, because dir y heads shall cause distorted sounds while dirty capstan and pinch roller shall occur wow/flutter and take-up fault.
   2) Lubricants been stained the surfaces of transmitting portion of the belts, idlers, capstan and pinch roller shall be removed, because slippery and faulty tape travel shall be caused.
   3) When oiling, only one or two drops shall be applied so as not to run over and be dispersed. Note should be taken of the metal fitting for the capstan and rotating portions of the idlers and pinch roller, especially.
   4) E-rings and poly slider washers shall be replaced with new ones, if once those have been removed. — No re-utilization due to unreliability.
   5) Regular spare-parts shall always be used for repair, because using irregular parts and tampering with the products shall cause deterioration, mulfunction and damage.

DISASSEMBLY INSTRUCTION

1. Removing the front cabinet

1) Remove 12 screws. (See figure 1)

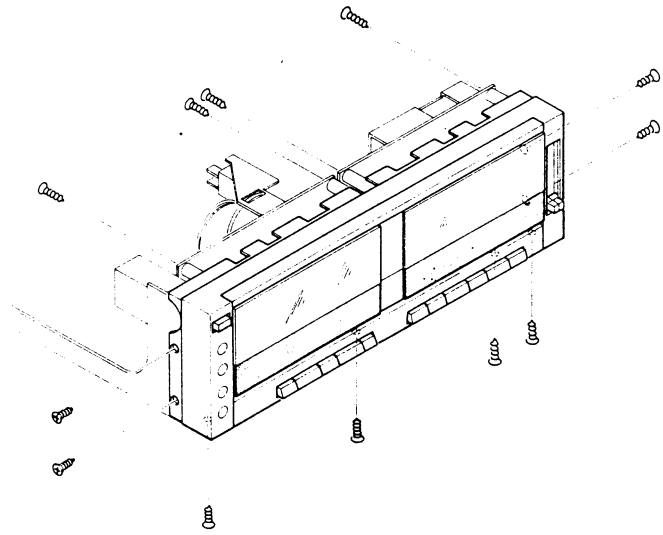


Fig. 1

2) Open the cassette lid and raise the front panel in the direction of the arrow. (See figure 2)

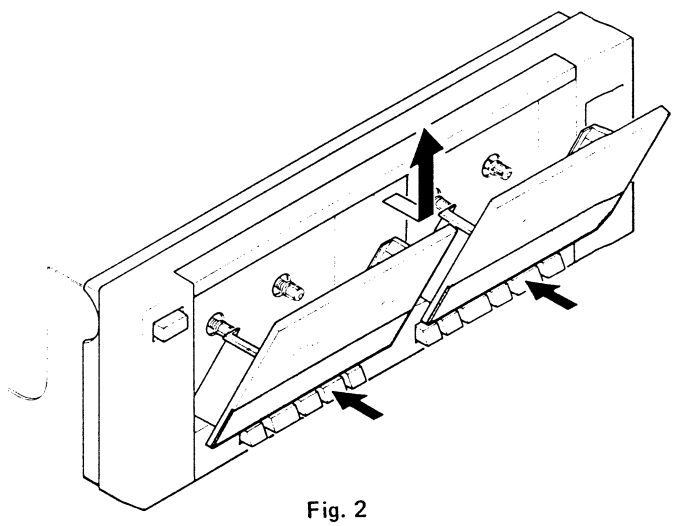


Fig. 2

2. Removing the mechanism

Removing the DECK-1

1) Remove 2 screws. (See figure 3)

Removing the DECK-2

2) Remove 3 screws. (See figure 3)

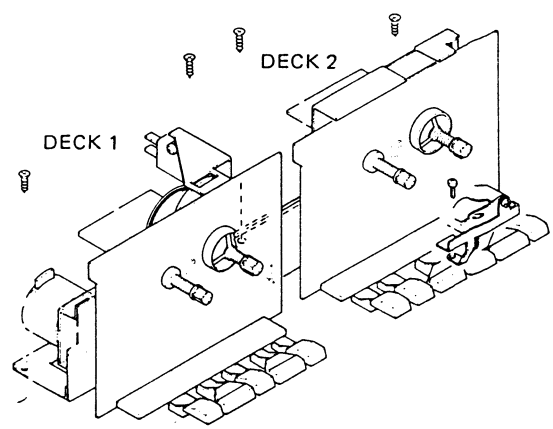


Fig. 3

MOUNTING OF MECHANISM

When assembling both mechanism of Deck (1) and Deck (2), take note of the following cautions.

1. When mounting Deck(1) and Deck(2), make certain that the rec/pb lever and dubbing lever are in position as illustrated.

(See figure 1)

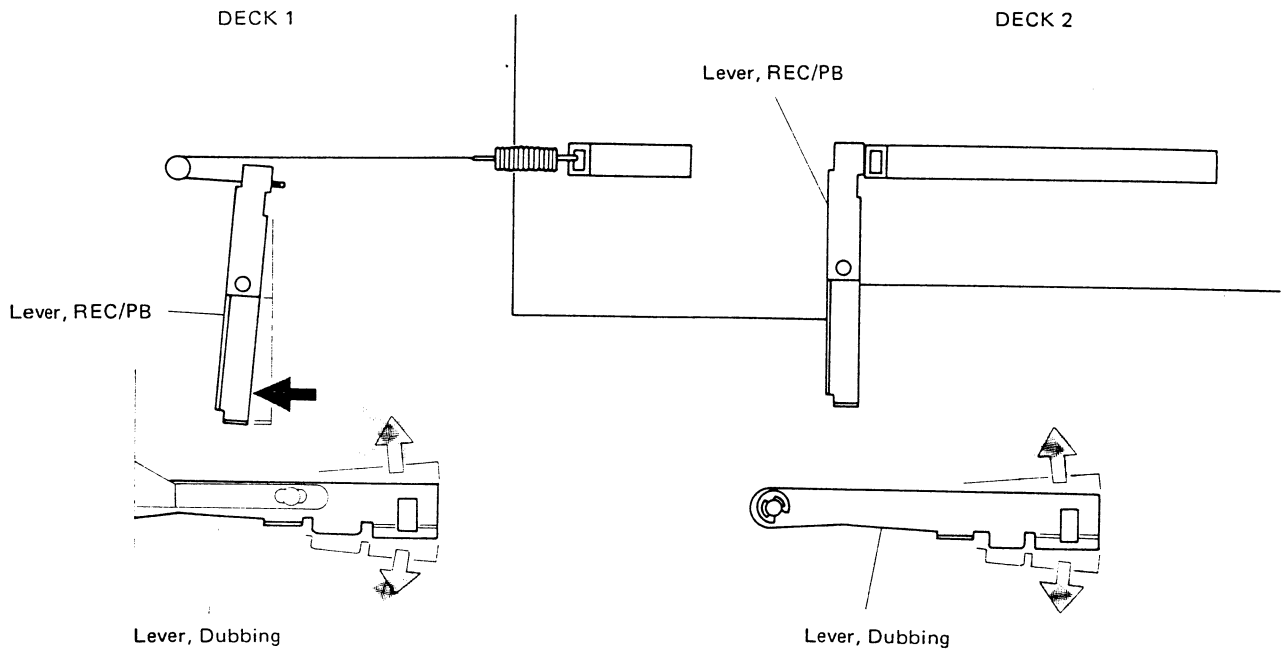


Fig. 1

2. Cauting when assembling

1) Mount the rec/pb lever to both Deck (1) and Deck (2) in position as illustrated. (See figure 2)

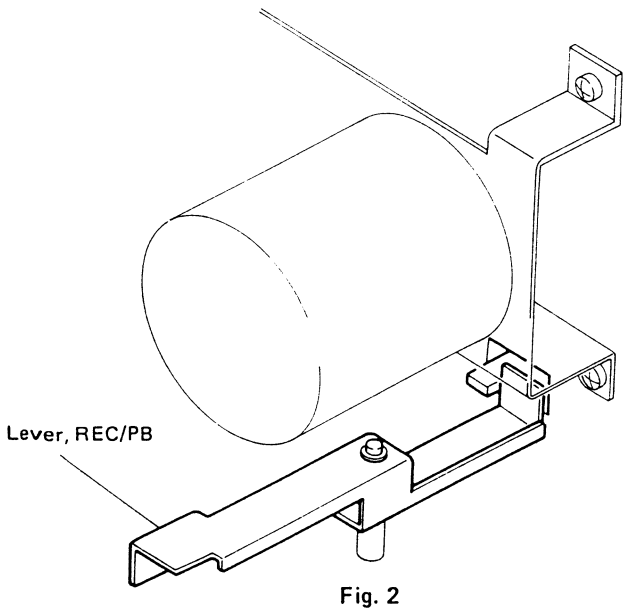


Fig. 2

2) The pins of play button and REC button must be located to the dubbing lever as illustrated. (See figure 3)

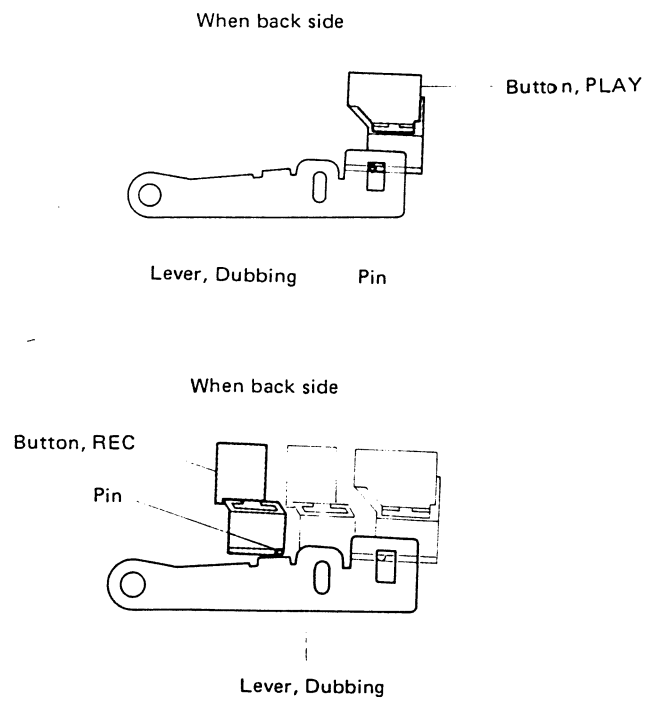
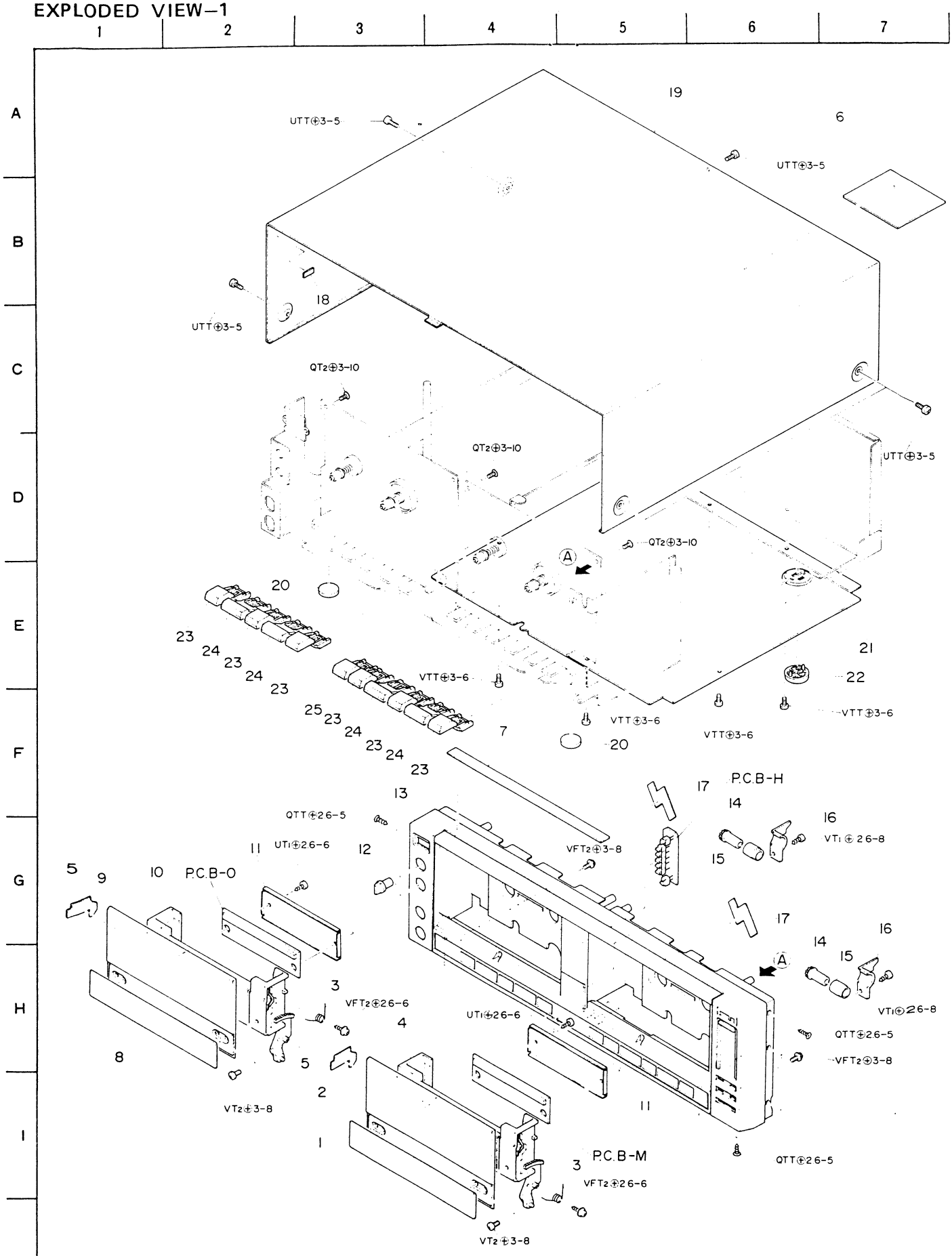


Fig. 3

EXPLODED VIEW–1

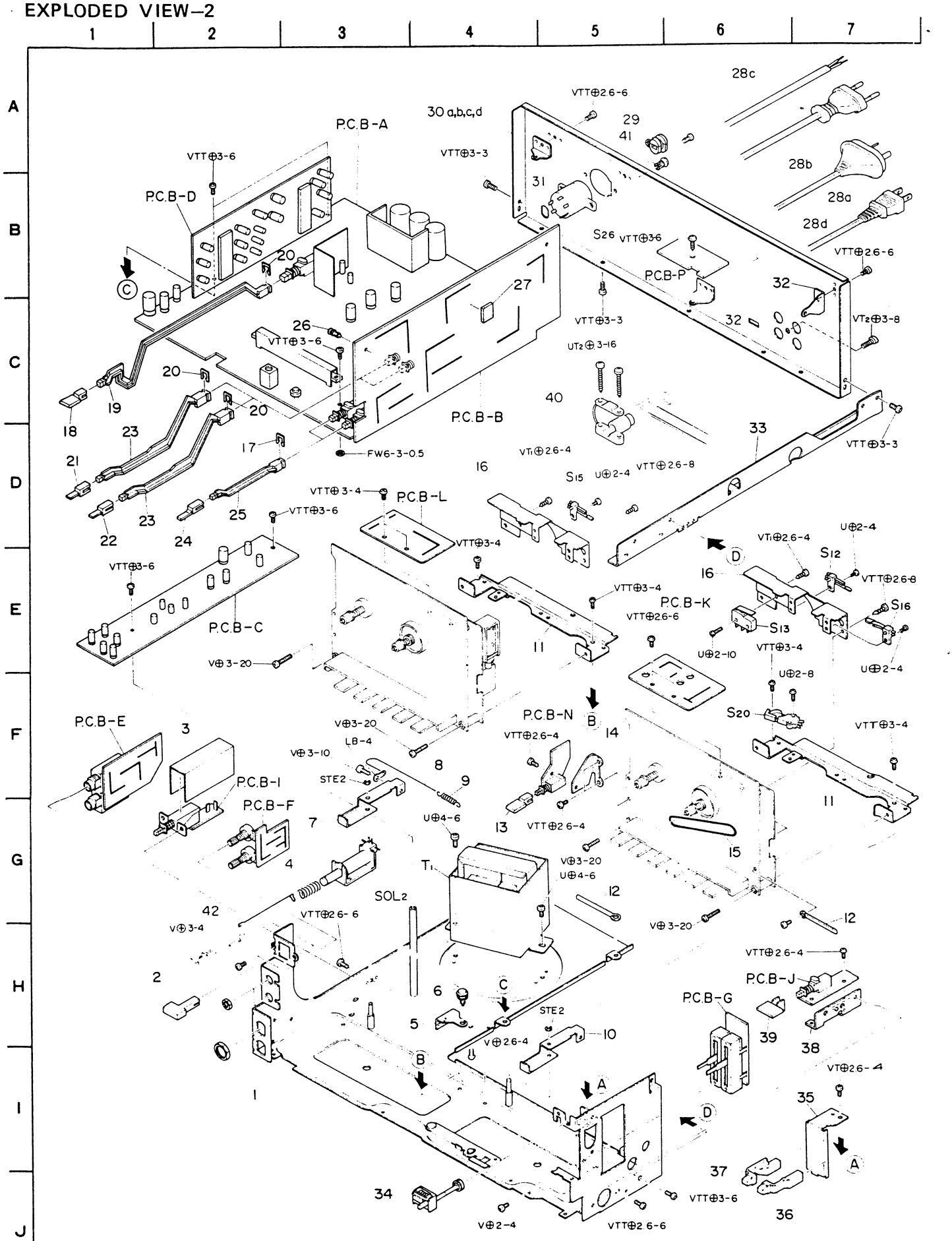


PARTS LIST

MECHANICAL PARTS

Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty	
1-1	82-186-042-11		Name plate, Cassette window R	*	1	
1-2	82-186-054-01		Window, Cassette RH	*	1	
1-3	82-186-241-21		T-spring, Cassette box	*	2	
1-4	82-186-048-31		Cassett box R ass'y F	*	1	
1-5	82-186-256-01		Wire cover	*	2	
1-6	82-186-287-01		Insulation sheet (E, K, G models only)	*	1	
1-7	82-186-036-01		Sheet, Bias Insulation	*	1	
1-8	82-186-045-11		Name plate, Cassette window L	*	1	
1-9	82-186-050-11		Window, Cassette LH	*	1	
1-10	82-186-047-31		Cassette box L ass'y F	*	1	
1-11	82-186-272-01		Cover C, Cassette box	*	2	
1-12	82-186-051-01		Knob	*	2	
1-13	82-186-046-61		Front cabinet ass'y F	*	1	
1-14	82-534-264-01		Gear, Oil-dump		2	
1-15	82-186-274-01		Oil-dump bearing	*	2	
1-16	82-175-210-11		Holder, Oil-dump	AD-3500	2	
1-17	82-186-266-01		Adhesive sheet	*	2	
1-18	82-175-233-01		Spacer 5-3.5-0,3	AD-3500	1	
1-19	82-186-002-01		Cabinet, Steel	*	1	
1-20	82-172-011-01		Rubber foot	SD-L35	2	
1-21	82-186-003-01		Cabinet, Bottom	*	1	
1-22	82-745-019-11		Foot		2	
1-23	82-186-009-01		Push-key, FF	*	6	
1-24	82-186-010-21		Push-key, PLAY	*	4	
1-25	82-186-011-11		Push-key, REC	*	1	

EXPLODED VIEW–2

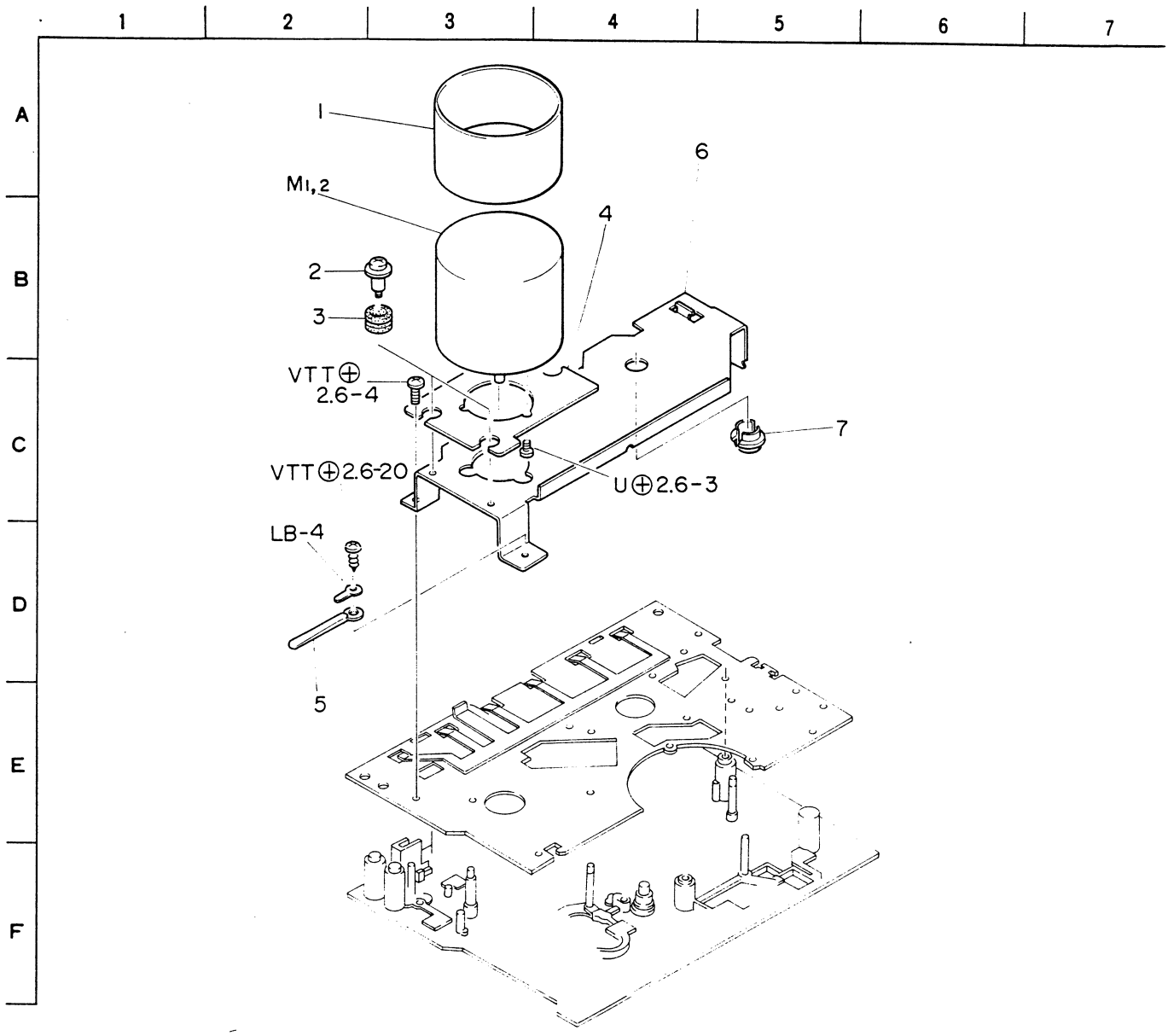


Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
2-1	82-186-236-31		Mechanism chassis ass'y	*	1
2-2	82-184-009-01		Push-button, POWER	FX-100	1
2-3	82-186-255-01		Cover, Power switch	*	1
2-4	82-186-240-01		C-spring, Dubbing	*	1
2-5	82-176-204-01		Holder, Roller	AC-3100	1
2-6	87-071-019-01		Roller ϕ7		1
2-7	82-186-267-01		Lever, REC/PB	*	1
2-8	87-096-088-01		String, Dial		1
2-9	82-176-205-01		E-spring, REC	AC-3100	1
2-10	82-186-276-01		Lever, REC/PB	*	1
2-11	82-186-229-11		Holder, Mechanism	*	2
2-12	87-038-039-01		Wire binder		2
2-13	82-186-013-01		Knob, MUTE	*	1
2-14	82-186-228-01		Holder, REC MUTE	*	1
2-15	82-461-317-11		Belt, Counter		1
2-16	82-186-202-11		Holder, Switch	*	2
2-17	82-186-277-01		Stopper, Rod	*	2
2-18	82-186-014-01		Knob, Dubbing	*	1
2-19	82-186-212-11		Rod, Dubbing	*	1
2-20	82-385-383-11		Stopper, Rod		3
2-21	82-186-039-01		Knob, Selector C	*	1
2-22	82-186-005-01		Knob, Selector A	*	1
2-23	82-186-213-11		Rod, Selector	*	2
2-24	82-186-006-01		Knob, Selector B	*	2
2-25	82-186-214-11		Rod, DOLBY	*	2
2-26	87-085-090-01		Nylon rivet		1
2-27	84-117-333-01		Cushion	AP-D50	1
2-28a	87-034-826-01		AC power cord (H, HU models only)		1
b	87-034-877-01		AC power cord (E model only)		1
c	87-034-872-01		AC power cord (K model only)		1
d	87-034-892-01		AC power cord (G model only)		1
2-29	87-085-165-01		Cord bushing (H, HU models only)		1
2-30a	82-186-029-01		Panel, Rear (H, HU models only)	*	1
b	82-186-031-01		Panel, Rear (E model only)	*	1
c	82-186-032-01		Panel, Rear (K model only)	*	1
d	82-186-032-01		Panel, Rear (G model only)	*	1
2-31	82-184-223-01		Holder, Circuit board	FX-100	1
2-32	82-168-213-01		Holder, Circuit board	AD-3600	H,HU:1 E,K,G:2
2-33	82-186-251-11		Chassis B2, Amp	*	1
2-34	87-040-160-01		Counter		1
2-35	82-186-022-01		Plate, REC knob	*	1
2-36	82-186-008-01		Knob R, REC	*	1
2-37	82-186-007-01		Knob L, REC	*	1
2-38	82-186-253-21		Holder, Switch B	*	1
2-39	84-120-016-01		Push-button, Selecter	AP-D60	1
2-40	87-085-166-01		Holder, AC power cord (E,K,G models only)		1
2-41	87-084-063-01		Nylon rivet ϕ3-5,5 (H, HU models only)		2
2-42	82-186-283-01		Lever, Solenoid	*	1

EXPLODED VIEW–3

As the MD-3 Mechanism is adopted in this model, the exploded view is omitted—See the supplement MD-3 Mechanism manual in case of repair and parts order.

The following is the exploded view of the exclusive mechanism and the motor attachments. The part-code list of such is described as well.



Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
3-1	82-551-617-01		Shield A, Motor		1
3-2	87-081-483-01		Motor screw, M2.6		3
3-3	87-087-029-01		Rubber cushion		3
3-4	82-598-228-01		Plate, Motor	CA-W10	1
3-5	87-038-039-01		Wire binder		1
3-6	82-598-229-01		Holder, Motor	CA-W10	1
3-7	82-585-326-11		Thrust bearing B		1

CIRCUIT DESCRIPTION

1. Tape selector circuit

Tape selection is automatic by detection of the chrome hole and metal hole in the cassette-half. The play equalizer amplifer is not independent for mechanism I and mechanism II each but one play equalizer amplifier is used in common for both. When different types of tape are inserted into mechanism I and mechanism II (for example, LH tape in mechanism I and chrome tape in mechanism II), the correct time constant of the play equalizer cannot be determined. Which of the two tapes being in play is detected (S_{7-8}), and whether it is at normal speed or high speed determines the time constant.

Speed	Tape	Time constant
NORMAL	LH	120μs
	CrO_2, MT	70μs
HIGH	LH	70μs
	CrO_2, MT	35μs

MT: METAL

The AND circuit is composed of Q510–Q519. The input is set to the collector and base, and the output, to the emitter. Q520 works as an inverter.

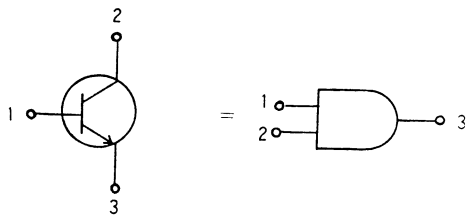


Fig. 1

Fig. 2 shows the composition of the tape selector and Table 2 shows the relation between the input and output.

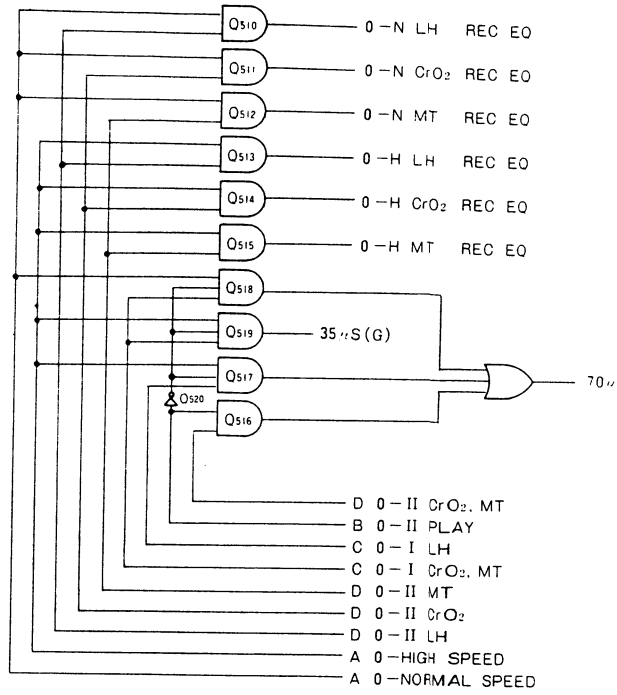


Fig. 2

When both 35μs and 70μs are set to "0", the time constant is 120μs.

Settings				Results			Contents
A	B	C	D	E	F	G	
HIGH SPEED	I MECH PLAY	I MECH CrO_2 HALL	II MECH CrO_2 HALL	120μs	70μs	35μs	
1	1	1	1	0	0	1	Double speed dubbing with mechanism I, CrO_2 tape or MT.
1	1	1	0	0	0	1	
1	1	0	1	0	1	0	Double speed dubbing with mechanism I, LH tape
1	1	0	0	0	1	0	
1	0	1	1	X	X	X	Double speed play of mechanism II is not possible
1	0	1	0	X	X	X	
1	0	0	1	X	X	X	
1	0	0	0	X	X	X	
0	1	1	1	0	1	0	Standard speed play and standard speed dubbing with mechanism I, CrO_2 tape of MT tape
0	1	1	0	0	1	0	
0	1	0	1	1	0	0	Standard speed dubbing with mechanism I, LH tape
0	1	0	0	1	0	0	
0	0	1	1	0	1	0	Standard speed play with mechanism II, CrO_2 tape or MT tape
0	0	0	1	0	1	0	
0	0	1	0	1	0	0	Standard speed play with mechanism II, LH tape
0	0	0	0	1	0	0	

Note: How to read the table (Example of the case marked*)

- The play equalizer is set to 35μs when A is double speed play, mechanism I CrO_2 hole provided, mechanism II CrO_2 hole provided.
  → Double speed dubbing
- Mark X shows that a condition never happens.
  → Double speed play with mechanism II

2. Muting circuit

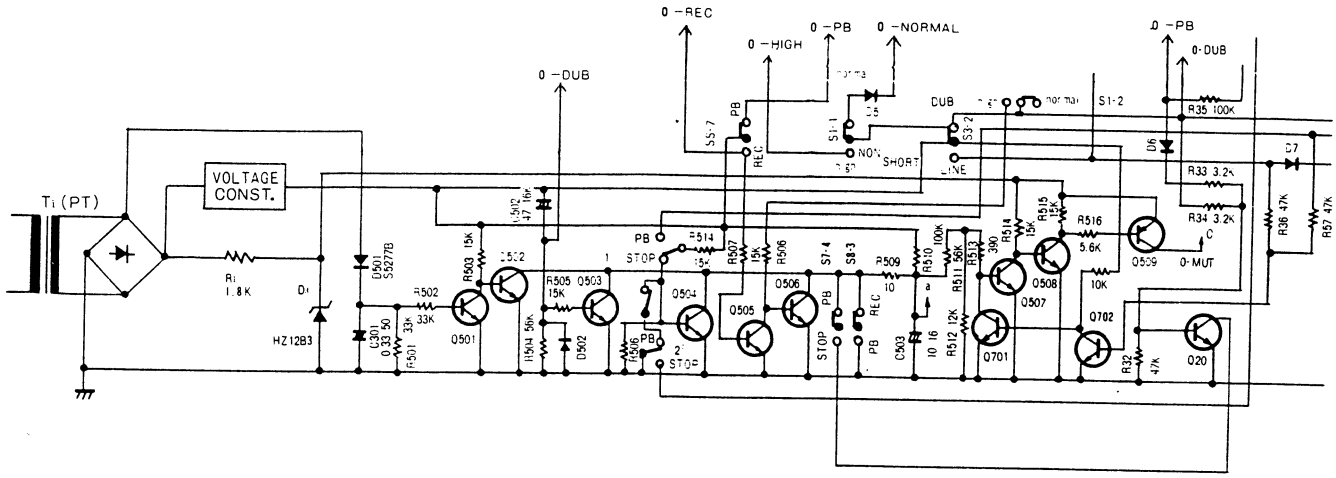


Fig. 3

1 Q501 is set to ON when the power is set to ON, to keep Q502 at OFF.

2 Next, Q508 is set to ON, and Q509, to ON; 0-MUT is output and muting is applied.

3 When mechanism I and mechanism II are set to PLAY, Q504 is set to OFF, Q503 is charged via R510, and Q507 is set to ON, Q508, OFF and Q509, OFF, and muting is released. The time required for this is approx. 230ms.

4 When the power is set to ON with the mechanism button kept pressed, Q503 is set to ON via the charge in C502 at first and muting is applied, but Q503 is set to OFF approx. 3 sec later, so muting is released.

5 When the power is set to ON, Q501 is set to OFF and Vcc remains at the same level, so Q502 is set to ON to discharge the charge in C503 and muting is applied.

6 When it is set to the HIGH SPEED position, Q506 is set to ON and muting is applied, so playback at HIGH speed is not possible.
When mechanism II is set to the record mode in this state, Q505 is set to ON, Q506, OFF, so the monitor sound can be heard.

7 S7-4 and S8-3 are alide switches; they keep contact earlier and release later than other switches. Muting is applied while these switches are operating. S8-3 is the REC/PB selector switch which prevents click noise when changing from PB → REC and REC → PB.

- Q504 is set to OFF when mechanism II is in the play mode, so S7-4 applies muting when mechanism I changes from STOP to PLAY and from PLAY to STOP.
- So that muting is not applied to the source monitor via the PLAY - STOP and STOP - PLAY operations of mechanism I when mechanism II is set to the LINE IN REC mode, one terminal of S7-4 is grounded via Q20 when mechanism II is set to modes other than the LINE IN REC mode; it is open when mechanism II is set to the LINE IN REC mode, and muting is not applied to the S7-4 operation.
Q20 works as a NOR gate of the collector output of BASE 2 input.

8 Q702 is the NOR gate of the BASE 2 input and the collector output: the input is set to 0-LINE and 0-DUB, and is connected to S3-2. The S3-2 switch timing is set to non-short, so S3-2 is set to low level at the mid point of the switch in both 0-LINE and 0-DUB, and Q702 is set to OFF, Q701, to ON and muting is applied.

9 Muting is applied when switching (S3-4, S1-4) LINE/DUB, NORMAL/HIGH by dropping the potential of C503 (+).

ACCESSORIES/PACKAGE

Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
1	82-186-854-01		Printed indiv., Packing	*	1
2	82-186-852-01		Cushion L, Printed indiv.	*	1
3	82-186-853-01		Cushion R, Printed indiv.	*	1
4	82-184-858-01		Sheet, Foamed mat		1
5	87-051-131-11		Poly-vinyl sack (H, HUmodels only)		1
6	87-051-135-11		Poly-vinyl sack (E, K, G models only)		1
7	87-056-627-01		Poly-vinyl sack		1
8	82-186-904-01		Instructions booklet	*	1
9	87-051-171-11		Poly-vinyl sack		1
10	87-056-008-11		Label, AC power cord (K model only)		1
11	87-056-009-51		Distributors list (H, E, K, G models only)		1
12	87-056-045-01		Guarantee card (HU models only)		1
13	87-056-057-01		Service station list (HU model only)		1
14	86-944-012-01		Connection cord CW-129BSK		2
15	87-032-845-01		Siemens plug (H, HU models only)		1
16	87-056-059-01		Guarantee card (G model only)		1

2. Muting circuit

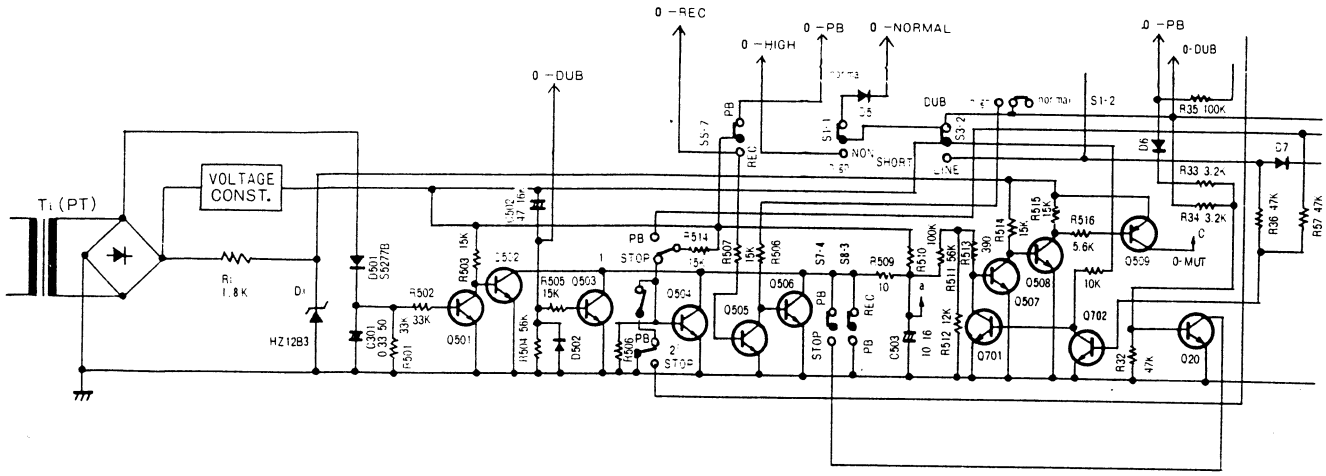


Fig. 3

1 Q501 is set to ON when the power is set to ON, to keep Q502 at OFF.

2 Next, Q508 is set to ON, and Q509, to ON; 0-MUT is output and muting is applied.

3 When mechanism I and mechanism II are set to PLAY, Q504 is set to OFF, Q503 is charged via R510, and Q507 is set to ON, Q508, OFF and Q509, OFF, and muting is released. The time required for this is approx. 230ms.

4 When the power is set to ON with the mechanism button kept pressed, Q503 is set to ON via the charge in C502 at first and muting is applied, but Q503 is set to OFF approx. 3 sec later, so muting is released.

5 When the power is set to ON, Q501 is set to OFF and Vcc remains at the same level, so Q502 is set to ON to discharge the charge in C503 and muting is applied.

6 When it is set to the HIGH SPEED position, Q506 is set to ON and muting is applied, so playback at HIGH speed is not possible.
When mechanism II is set to the record mode in this state, Q505 is set to ON, Q506, OFF, so the monitor sound can be heard.

7 S7-4 and S8-3 are alide switches; they keep contact earlier and release later than other switches. Muting is applied while these switches are operating. S8-3 is the REC/PB selector switch which prevents click noise when changing from PB → REC and REC → PB.

- Q504 is set to OFF when mechanism II is in the play mode, so S7-4 applies muting when mechanism I changes from STOP to PLAY and from PLAY to STOP.
- So that muting is not applied to the source monitor via the PLAY - STOP and STOP - PLAY operations of mechanism I when mechanism II is set to the LINE IN REC mode, one terminal of S7-4 is grounded via Q20 when mechanism II is set to modes other than the LINE IN REC mode; it is open when mechanism II is set to the LINE IN REC mode, and muting is not applied to the S7-4 operation.
Q20 works as a NOR gate of the collector output of BASE 2 input.

8 Q702 is the NOR gate of the BASE 2 input and the collector output: the input is set to 0-LINE and 0-DUB, and is connected to S3-2. The S3-2 switch timing is set to non-short, so S3-2 is set to low level at the mid point of the switch in both 0-LINE and 0-DUB, and Q702 is set to OFF, Q701, to ON and muting is applied.

9 Muting is applied when switching (S3-4, S1-4) LINE/DUB, NORMAL/HIGH by dropping the potential of C503 (+).

ACCESSORIES/PACKAGE

Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
1	82-186-854-01		Printed indiv., Packing	*	1
2	82-186-852-01		Cushion L, Printed indiv.	*	1
3	82-186-853-01		Cushion R, Printed indiv.	*	1
4	82-184-858-01		Sheet, Foamed mat		1
5	87-051-131-11		Poly-vinyl sack (H, HUmodels only)		1
6	87-051-135-11		Poly-vinyl sack (E, K, G models only)		1
7	87-056-627-01		Poly-vinyl sack		1
8	82-186-904-01		Instructions booklet	*	1
9	87-051-171-11		Poly-vinyl sack		1
10	87-056-008-11		Label, AC power cord (K model only)		1
11	87-056-009-51		Distributors list (H, E, K, G models only)		1
12	87-056-045-01		Guarantee card (HU models only)		1
13	87-056-057-01		Service station list (HU model only)		1
14	86-944-012-01		Connection cord CW-129BSK		2
15	87-032-845-01		Siemens plug (H, HU models only)		1
16	87-056-059-01		Guarantee card (G model only)		1

ELECTRICAL MAIN PARTS LIST

Symbol No.	Part No.	Description
≪ MAIN CIRCUIT BOARD SECTION ≫		
PCB-A	*	Main circuit board
IC101	87-027-865-01	IC, LA-6458SS
Q1	89-412-653-41	Transistor, 2SD1265 OP
Q2, 18, 103, 104, 113, 114, 115, 116, 117, 118, 119, 120, 129, 130, 133, 134, 135, 136, 137, 138, 147, 148, 149, 150, 151, 152, 167, 168, 171, 172	89-309-455-61	Transistor, 2SC945L (P, Q)
Q3, 12, 13, 16, 17, 20, 105, 106, 107, 108, 109, 110, 111, 112, 121, 122, 123, 124, 153, 154, 155, 156, 173, 174	89-318-155-01	Transistor, 2SC1815 (GR)
Q4	89-408-805-01	Transistor, 2SD880 (GR)
Q6, 7, 8, 9, 10, 19, 25, 126, 127, 128	89-320-011-21	Transistor, 2SC2001 (K)
Q11	89-107-335-61	Transistor, 2SA733K, P
Q14	89-110-155-01	Transistor, 2SA1015 (GR)
Q101, 102, 169, 170	89-322-406-01	Transistor, 2SC2240 (BL)
D1	87-027-376-01	Diode, 1B4B41 (H, HU, models only)
D1	87-027-163-01	Diode, 1B4B1 (E, K, G models only)
D2, 19, 20	87-027-365-01	Diode, S5277B
D3	87-027-509-01	Zener diode, HZ-12B-3
D4	87-027-449-01	Zener diode, HZ-15L-3
D5, 7, 8, 9, 10, 11, 12, 13, 15, 16, 21	87-027-097-01	Diode, IS1555
D14	87-027-332-01	Zener diode, HZ6B1L
L101	82-186-614-01	OSC coil B
L102	82-186-613-01	OSC coil A
L103, 104	87-003-051-01	Choke coil, 470μH
L105, 106	87-003-073-01	Coil, 6.8mH
L107, 108, 109, 110	87-007-118-01	Coil, 25mH
L201, 202	82-371-622-01	Coil, 23mH
MPX, F1, MPX, F2	87-008-252-01	Low-pass filter, 100K
J1, 2, 3, 4	87-049-055-01	Pin, 4P (LINE IN/OUT)
S1, 3	82-186-624-01	Push-switch (SPEED, DUBBING/LINE)
S2	82-186-622-01	Push-switch (TRACK, I/II)
S4, 5	82-186-623-01	Push-switch (DOLBY ON/OFF, DOLBY B/C)
S7	82-186-631-01	Slide switch (STOP/PB)
S8	82-186-630-01	Slide switch (REC/PB)
SFR101, 102, 103, 104	87-021-624-01	Semi-fixed resistor, 50kΩ-B
SFR105, 106, 107, 108, 117, 118	87-021-730-01	Semi-fixed resistor, 2.2kΩ-B
SFR109, 110,	87-021-729-01	Semi-fixed resistor, 1kΩ-B
SFR111, 112	87-021-687-01	Semi-fixed resistor, 30kΩ-B
SFR113, 114, 115, 116	87-021-615-01	Semi-fixed resistor, 47kΩ-B
PIN1	87-049-080-01	Pin, 2P
PIN2	87-049-038-01	Pin, 3P
PIN3	87-049-034-01	Pin, 4P
		< Resistors >
⚠R10	87-029-088-01	1.5Ω ½W Fuse resistor
⚠R9	87-029-009-01	22Ω 1W Fuse resistor
⚠R7	87-029-369-01	47Ω 1W Fuse resistor
⚠R13	87-029-109-01	220Ω ¼W Fuse resistor
		< Capacitors >
C107, 108, 137, 138	87-015-617-01	10μF 16V Electrolytic LL
C4, 10	82-186-685-01	3300μF 35V Electrolytic
C167, 168, 419, 420	87-014-037-01	150pF PP
C19	87-014-128-01	1500pF 630V PP
C21	82-304-706-01	2200pF 630V PP
≪ SUB CIRCUIT BOARD SECTION ≫		
PCB-B	*	Sub circuit board
IC401	87-027-865-01	IC, LA6458SS
Q401, 402, 403, 404, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519	89-309-455-61	Transistor, 2SC945 L (P,Q)
Q501, 502 503, 504, 505, 506, 507, 508, 522, 524	89-318-155-01	Transistor, 2SC1815 (GR)
Q509	89-107-336-01	Transsistor, 2SA733 (P)
Q521	89-318-464-51	Transistor, 2SC1846 (R, S)
Q523	89-110-155-01	Transistor, 2SA1015 (GR)
D501	87-027-365-01	Diode, S5277B
D502, 503, 504, 505, 506	87-027-097-01	Diode, 1S1555
L401, 402	87-003-073-01	Coil, 6.8mH
SFR401, 402	87-021-687-01	Semi-fixed resistor, 30kΩ-B
PIN5	87-049-038-01	Pin, 3P
PIN4, 6	87-049-050-01	Pin, 6P
≪ MS CIRCUIT BOARD SECTION ≫		
PCB-C	*	MS circuit board
IC601	87-027-762-01	IS, MS51143L
IC702	87-027-739-01	IC, NJM4556D
Q601, 602, 603, 604, 606, 607, 608, 609, 610, 613, 614, 615, 616, 617, 618	89-318-155-01	Transistor, 2SC1815 (GR)
Q605	89-405-712-01	Transistor, 2SD571L
Q611	89-309-455-61	Transistor, 2SC945L (P, Q)
Q612	89-318-464-51	Transistor, 2SC1846R, S
D601, 603 604, 605, 606, 612, 613, 615, 616	87-027-097-01	Diode, IS1555
D602,607	87-027-365-01	Diode, S5277B
PIN7	87-049-080-01	Pin, 2P
≪ DOLBY-NR CIRCUIT BOARD SECTION ≫		
PCB-D	82-184-620-11	Dolby-NR circuit board
IC301, 302	87-027-862-01	IC, HA12038
L301, 302	87-005-155-01	Coil, 36mH
PIN	87-049-117-01	Pin, 7P
PIN	87-049-119-01	Pin, 9P
		< Resistors >
R309, 310	87-025-271-01	5.1kΩ ¼W ±1% Metal film
R311, 312	87-025-295-01	15kΩ ¼W ±1% Metal film
R335, 336	87-025-296-01	56kΩ ¼W ±1% Metal film
		< Capacitors >
C315, 316, 351, 352	87-015-617-01	10μF 16V Electrolytic LL
C321, 322, 323, 324, 345, 346	87-015-366-01	0.15μF 10V Aluminum solid
≪ JACK CIRCUIT BOARD SECTION ≫		
PCB-E	*	Jack circuit board
IC101	87-027-182-01	IC, μPC1023H
J5, 6	82-186-632-01	Jack, 6.3φ (MIXING MIC, PHONES)
≪ VOLUME-1 CIRCUIT BOARD SECTION ≫		
PCB-F	*	Volume-1 circuit board
VR101	82-186-628-01	Volume, 20kΩ-A (MIC)
VR102	82-186-629-01	Volume, 10kΩ-B (LH BIAS FINE)
≪ VOLUME-2 CIRCUIT BOARD SECTION ≫		
PCB-G	*	Volume-2 circuit board
VR103	82-186-627-01	Slide volume, 30kΩ-A (REC LEVEL)
≪ LED-1 CIRCUIT BOARD SECTION ≫		
PCB-H	*	LED-1 circuit board
D801	87-027-772-01	LED, GL-9PR4 (DUBBING)
D802, 803, 805, 806	87-027-354-01	LED, GL-9PR2 (HIGH SPEED, A+B, DOLBY C, RECORD)
D804	87-027-352-01	LED, GL-9NG2 (DOLBY B)
D807	87-027-773-01	LED, GL-9NG4 (CONT. PLAY)
≪ SWITCH CIRCUIT BOARD SECTION ≫ = "H, HU" models only		
PCB-I	*	Switch circuit board
⚠S25	87-031-730-01	Push-switch (POWER)
		< Capacitor >
⚠C1	87-019-110-01	0.01μF Spark killer
≪ DECK SELECTOR CIRCUIT BOARD SECTION ≫		
PCB-J	*	Deck selector circuit board
S17	82-186-623-01	Push-switch (CONTINUOUS)
≪ RELAY-1 CIRCUIT BOARD SECTION ≫		
PCB-K	*	Relay-1 circuit board
PIN10	87-049-138-01	Pin, 5P
PIN9	87-049-139-01	Pin, 7P
≪ RELAY-2 CIRCUIT BOARD SECTION ≫		
PCB-L	*	Relay-2 circuit board
Q701, 702	89-318-155-01	Transistor, 2SC1815 (GR)
PIN8	87-049-140-01	Pin, 11P
≪ LEVEL INDICATOR CIRCUIT BOARD SECTION ≫		
D1 ~ 14	82-186-621-01	LED, LT3320 (With/PCB-M)
≪ REC MUTE CIRCUIT BOARD SECTION ≫		
PCB-N	*	REC MUTE circuit board
≪ LED-2 CIRCUIT BOARD SECTION ≫		
D1 ~ 5	82-186-635-01	LED, LT1076 (LH, CrO_2, METAL, 70μs, 120μs, (W/PCB-O)
≪ FUSE CIRCUIT BOARD SECTION ≫ = "E, K, G" models only		
⚠PCB-P	82-186-686-01	Fuse circuit board
⚠F1	87-035-190-01	Fuse, "T" 2A
⚠	87-033-147-01	Fuse clamp
⚠	82-304-743-01	IP terminal
		< Capacitor >
⚠C1	87-019-112-01	0.01μF Spark killer
≪ MISCELLANEOUS ≫		
⚠T1	82-186-618-01	Power transformer (H, HU models only)
⚠T1	82-186-619-02	Power transformer (E model only)
⚠T1	82-186-620-01	Power transformer (K, G models only)
RPH1	87-046-219-11	REC/PB head, 4 ch
PH1	87-046-218-11	PB head, 4 ch
	82-186-254-01	EH dummy head
EH1	87-046-220-01	Erase head
EH2	87-046-221-01	Erase head
M1, 2	87-045-187-01	Motor, DC-EG
SOL1	82-186-683-01	Solenoid ass'y
SOL2	82-186-637-01	Solenoid, MS
PL1	82-186-681-01	Lamp ass'y, 8V, 50mA
PL2	82-186-682-01	Lamp ass'y, 8V, 50mA
⚠	87-033-140-01	Splice connector (H, HU models only)
⚠	87-085-165-01	Cord bushing (H, HU models only)
	87-450-414-01	Lug terminal LB4
⚠	87-034-826-01	AC power cord (H, HU models only)
⚠	87-034-877-01	AC power cord (E model only)
⚠	87-034-872-01	AC power cord (K model only)
⚠	87-034-892-01	AC power cord (G model only)
⚠	87-085-166-01	Holder, AC power cord (E, K, G models only)
S10, 11	87-031-537-01	Micro switch (I, II PLAY DETECTION)
S12, (S15)	82-186-636-01	Leaf switch (II MECHANISM DETECTION
S13	87-031-693-01	Micro switch (II MECHANISM METAL DETECTION)
S15	87-031-707-01	Micro switch (I MECHANISM CrO_2 DETECTION)
S16	82-283-631-01	Leaf switch (MISS ERASE BLOCKING)
S18, 19	87-031-548-01	Leaf switch (I, II MOTOR, ON/OFF)
S20	87-031-491-01	Micro switch (REC, ON/OFF)
S21, 22	87-031-615-01	Leaf switch (I, II FF/REW)
⚠S25	87-031-735-01	Push-switch (POWER) (E, K, G models only)
⚠S26	87-031-586-01	Rotary switch (VOLTAGE SELECTOR) (H, HU models only)
CON1	82-186-656-01	2P connector ass'y
CON7	82-186-652-01	2P connector ass'y
CON5	82-186-655-01	3P connector ass'y
CON2	82-186-662-01	3P connector ass'y
CON3	82-186-650-01	4P connector ass'y
CON10	82-186-674-01	5P connector ass'y
CON4	82-186-651-01	6P connector ass'y
CON6	82-186-654-01	6P connector ass'y
CON9	82-186-672-01	7P connector ass'y
CON8	82-186-660-01	11P connector ass'y

Part No.	Description
87-021-729-01	Semi-fixed resistor, 1kΩ-B
87-021-687-01	Semi-fixed resistor, 30kΩ-B
87-021-615-01	Semi-fixed resistor, 47kΩ-B
87-049-080-01	Pin, 2P
87-049-038-01	Pin, 3P
87-049-034-01	Pin, 4P
	< Resistors >
87-029-088-01	1.5Ω ½W Fuse resistor
87-029-009-01	22Ω 1W Fuse resistor
87-029-369-01	47Ω 1W Fuse resistor
87-029-109-01	220Ω ¼W Fuse resistor
	< Capacitors >
87-015-617-01	10μF 16V Electrolytic LL
82-186-685-01	3300μF 35V Electrolytic
87-014-037-01	150pF PP
87-014-128-01	1500pF 630V PP
82-304-706-01	2200pF 630V PP

≪CUIT BOARD SECTION≫

*	Sub circuit board
87-027-865-01	IC, LA6458SS
89-309-455-61	Transistor, 2SC945 L (P,Q)
89-318-155-01	Transistor, 2SC1815 (GR)
89-107-336-01	Transsistor, 2SA733 (P)
89-318-464-51	Transistor, 2SC1846 (R, S)
89-110-155-01	Transistor, 2SA1015 (GR)
87-027-365-01	Diode, S5277B
87-027-097-01	Diode, 1S1555
87-003-073-01	Coil, 6.8mH
87-021-687-01	Semi-fixed resistor, 30kΩ-B
87-049-038-01	Pin, 3P
87-049-050-01	Pin, 6P

≪CUIT BOARD SECTION≫

*	MS circuit board
87-027-762-01	IS, MS51143L
87-027-739-01	IC, NJM4556D
89-318-155-01	Transistor, 2SC1815 (GR)

Symbol No.	Part No.	Description
Q605	89-405-712-01	Transistor, 2SD571L
Q611	89-309-455-61	Transistor, 2SC945L (P, Q)
Q612	89-318-464-51	Transistor, 2SC1846R, S
D601, 603 604, 605, 606, 612, 613, 615, 616	87-027-097-01	Diode, IS1555
D602,607	87-027-365-01	Diode, S5277B
PIN7	87-049-080-01	Pin, 2P

≪DOLBY-NR CIRCUIT BOARD SECTION≫

PCB-D	82-184-620-11	Dolby-NR circuit board
IC301, 302	87-027-862-01	IC, HA12038
L301, 302	87-005-155-01	Coil, 36mH
PIN	87-049-117-01	Pin, 7P
PIN	87-049-119-01	Pin, 9P
		< Resistors >
R309, 310	87-025-271-01	5.1kΩ ¼W ±1% Metal film
R311, 312	87-025-295-01	15kΩ ¼W ±1% Metal film
R335, 336	87-025-296-01	56kΩ ¼W ±1% Metal film
		< Capacitors >
C315, 316, 351, 352	87-015-617-01	10μF 16V Electrolytic LL
C321, 322, 323, 324, 345, 346	87-015-366-01	0.15μF 10V Aluminum solid

≪JACK CIRCUIT BOARD SECTION≫

PCB-E	*	Jack circuit board
IC101	87-027-182-01	IC, μPC1023H
J5, 6	82-186-632-01	Jack, 6.3φ (MIXING MIC, PHONES)

≪VOLUME-1 CIRCUIT BOARD SECTION≫

PCB-F	*	Volume-1 circuit board
VR101	82-186-628-01	Volume, 20kΩ-A (MIC)
VR102	82-186-629-01	Volume, 10kΩ-B (LH BIAS FINE)

≪VOLUME-2 CIRCUIT BOARD SECTION≫

PCB-G	*	Volume-2 circuit board
VR103	82-186-627-01	Slide volume, 30kΩ-A (REC LEVEL)

≪LED-1 CIRCUIT BOARD SECTION≫

PCB-H	*	LED-1 circuit board
D801	87-027-772-01	LED, GL-9PR4 (DUBBING)
D802, 803, 805, 806	87-027-354-01	LED, GL-9PR2 (HIGH SPEED, A+B, DOLBY C, RECORD)
D804	87-027-352-01	LED, GL-9NG2 (DOLBY B)
D807	87-027-773-01	LED, GL-9NG4 (CONT. PLAY)

≪SWITCH CIRCUIT BOARD SECTION≫
= "H, HU" models only

PCB-I	*	Switch circuit board
⚠S25	87-031-730-01	Push-switch (POWER)
		< Capacitor >
⚠C1	87-019-110-01	0.01μF Spark killer

≪DECK SELECTOR CIRCUIT BOARD SECTION≫

PCB-J	*	Deck selector circuit board
S17	82-186-623-01	Push-switch (CONTINUOUS)

≪RELAY-1 CIRCUIT BOARD SECTION≫

PCB-K	*	Relay-1 circuit board
PIN10	87-049-138-01	Pin, 5P
PIN9	87-049-139-01	Pin, 7P

≪RELAY-2 CIRCUIT BOARD SECTION≫

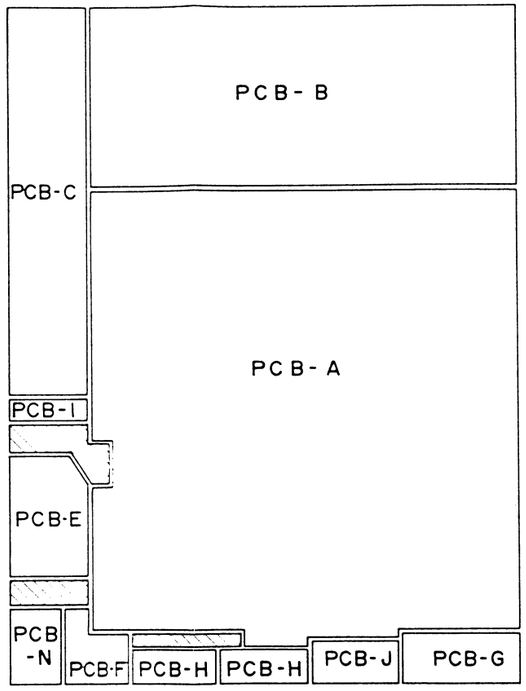
PCB-L	*	Relay-2 circuit board
Q701, 702	89-318-155-01	Transistor, 2SC1815 (GR)
PIN8	87-049-140-01	Pin, 11P

Symbol No.	Part No.	Description
≪LEVEL INDICATOR CIRCUIT BOARD SECTION≫		
D1 ~ 14	82-186-621-01	LED, LT3320 (With/PCB-M)
≪REC MUTE CIRCUIT BOARD SECTION≫		
PCB-N	*	REC MUTE circuit board
≪LED-2 CIRCUIT BOARD SECTION≫		
D1 ~ 5	82-186-635-01	LED, LT1076 (LH, CrO_2, METAL, 70μs, 120μs, (W/PCB-O)
≪FUSE CIRCUIT BOARD SECTION≫		
= "E, K, G" models only		
⚠PCB-P	82-186-686-01	Fuse circuit board
⚠F1	87-035-190-01	Fuse, "T" 2A
⚠	87-033-147-01	Fuse clamp
⚠	82-304-743-01	IP terminal
		< Capacitor >
⚠C1	87-019-112-01	0.01μF Spark killer
≪MISCELLANEOUS≫		
⚠T1	82-186-618-01	Power transformer (H, HU models only)
⚠T1	82-186-619-02	Power transformer (E model only)
⚠T1	82-186-620-01	Power transformer (K, G models only)
RPH1	87-046-219-11	REC/PB head, 4 ch
PH1	87-046-218-11	PB head, 4 ch
	82-186-254-01	EH dummy head
EH1	87-046-220-01	Erase head
EH2	87-046-221-01	Erase head
M1, 2	87-045-187-01	Motor, DC-EG
SOL1	82-186-683-01	Solenoid ass'y
SOL2	82-186-637-01	Solenoid, MS
PL1	82-186-681-01	Lamp ass'y, 8V, 50mA
PL2	82-186-682-01	Lamp ass'y, 8V, 50mA
⚠	87-033-140-01	Splice connector (H, HU models only)
⚠	87-085-165-01	Cord bushing (H, HU models only)
	87-450-414-01	Lug terminal LB4
⚠	87-034-826-01	AC power cord (H, HU models only)
⚠	87-034-877-01	AC power cord (E model only)
⚠	87-034-872-01	AC power cord (K model only)
⚠	87-034-892-01	AC power cord (G model only)
⚠	87-085-166-01	Holder, AC power cord (E, K, G models only)
S10, 11	87-031-537-01	Micro switch (I, II PLAY DETECTION)
S12, (S15)	82-186-636-01	Leaf switch (II MECHANISM DETECTION)
S13	87-031-593-01	Micro switch (II MECHANISM METAL DETECTION)
S15	87-031-707-01	Micro switch (I MECHANISM CrO_2 DETECTION)
S16	82-283-631-01	Leaf switch (MISS ERASE BLOCKING)
S18, 19	87-031-548-01	Leaf switch (I, II MOTOR, ON/OFF)
S20	87-031-491-01	Micro switch (REC, ON/OFF)
S21, 22	87-031-615-01	Leaf switch (I, II FF/REW)
⚠S25	87-031-735-01	Push-switch (POWER) (E, K, G models only)
⚠S26	87-031-586-01	Rotary switch (VOLTAGE SELECTOR) (H, HU models only)
CON1	82-186-656-01	2P connector ass'y
CON7	82-186-652-01	2P connector ass'y
CON5	82-186-655-01	3P connector ass'y
CON2	82-186-662-01	3P connector ass'y
CON3	82-186-650-01	4P connector ass'y
CON10	82-186-674-01	5P connector ass'y
CON4	82-186-651-01	6P connector ass'y
CON6	82-186-654-01	6P connector ass'y
CON9	82-186-672-01	7P connector ass'y
CON8	82-186-660-01	11P connector ass'y

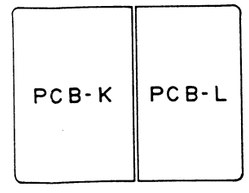
⚠ Safety component symbol
This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.

Note; Combination Circuit Board
The parts on the electrical parts list which are indicated by an asterisk (*) are supplied as one single combined circuit board. Therefore, they will not be supplied separately. If this becomes necessary, please order the entire circuit board.

Combination circuit board A 82-186-601-21



Combination circuit board B 82-186-638-11



• Semiconductor ceramic capacitor

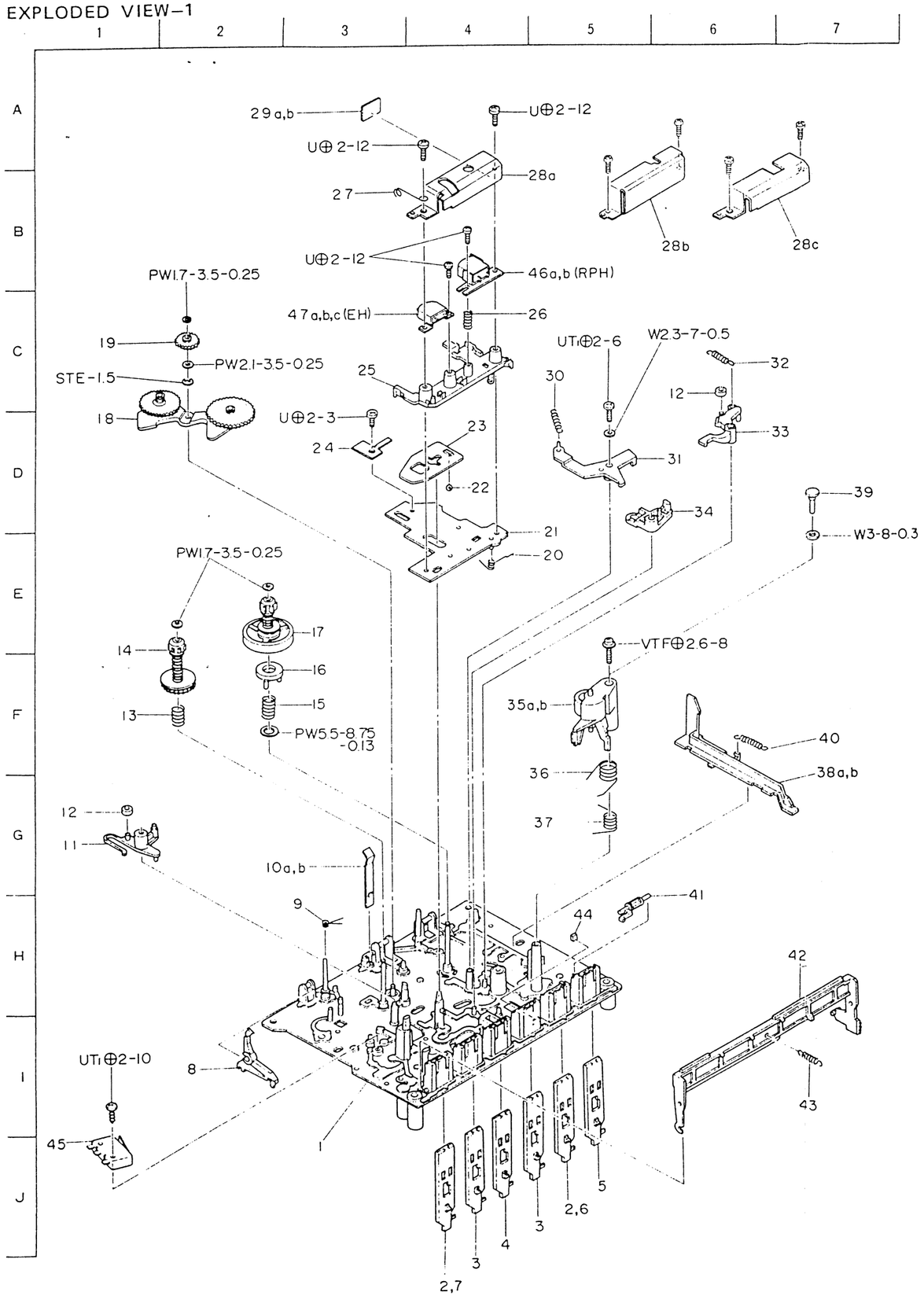
89-612-000-01

Capacitors	Parts No.
33pF	255
39pF	275
100pF	415
150pF	455
390pF	545
470pF	555

Capacitors	Parts No.
0.001 μF	615
0.0012μF	625
0.0015μF	635
0.0022μF	665
0.0047μF	725

Example: 100pF 89-612-415-01

EXPLODED VIEW–1



20a

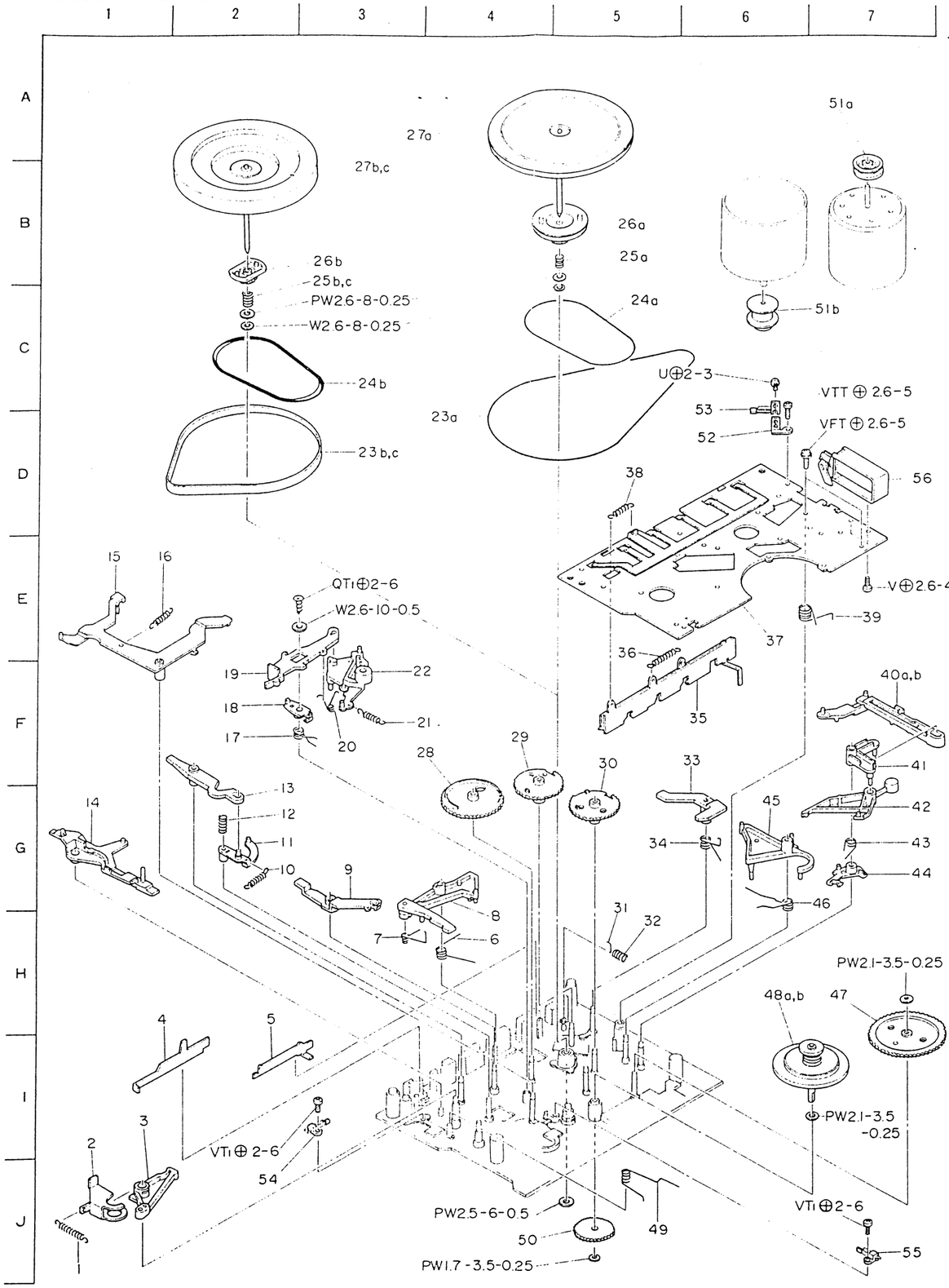
PARTS LIST

MECHANICAL PARTS

▪ *mark in this part list shows exclusive part.

Ref. No.	Part No.	Description	CS-360	CS-770A	CS-500
1-1	82-585-325-41	Outsert chassis ass'y	1	1	1
1-2	82-585-337-11	Plate button, REC	2	2	–
1-3	82-585-360-01	Plate button, FR B	2	2	2
1-4	82-585-277-41	Plate button, FR	1	1	1
1-5	82-585-361-01	Plate button, PAUSE	1	1	1
1-6	82-585-382-01	Plate button, STOP B	–	–	1
1-7	82-585-383-01	Plate button, REC B	–	–	1
1-8	82-585-255-11	REC blocking lever	1	1	1
1-9	82-585-294-11	T-spring, Center shift	1	1	1
1-10 a	82-585-319-01	P-spring, Cassette pressure	1	1	–
1-10 b	82-594-232-01	P-spring, Cassette pressure	–	–	1
1-11	82-585-252-01	Lever, Brake L	1	1	1
1-12	82-585-286-01	Rubber cushion, Brake	2	2	2
1-13	82-585-290-01	C-spring, Back tension	1	1	1
1-14	82-585-215-11	Supply reel platform ass'y	1	1	1
1-15	82-585-292-41	C-spring, Slip disk	1	1	1
1-16	82-585-272-11	Slip disk T	1	1	1
1-17	82-585-210-31	Take-up reel platform ass'y	1	1	1
1-18	82-585-231-21	FR lever ass'y	1	1	1
1-19	82-585-235-01	Gear A, REW	1	1	1
1-20	82-585-295-21	T-spring, Actuating	1	1	1
1-21	82-585-208-11	Actuating chassis	1	1	1
1-22	87-073-005-01	Steel ball 2φ	1	1	1
1-23	82-585-284-01	P-spring, Actuating	1	1	1
1-24	82-585-349-01	Holder, Idler lever	1	1	1
1-25	82-585-209-31	Head base	1	1	1
1-26	82-585-291-01	C-spring, RPH	1	1	1
1-27	82-591-245-01	Wire holder	1	–	–
1-28 a	82-595-633-11	Shield plate, Head	1	–	–
1-28 b	82-588-628-21	Shield plate, Head	–	1	–
1-28 c	82-594-625-01	Shield plate, Head	–	–	1
1-29 a	82-591-406-01	Sheet 11-15-0.1	1	–	1
1-29 b	82-588-222-01	Sheet 8-15-0.1	–	1	–
1-30	82-585-313-21	E-spring, Play idler	1	1	1
1-31	82-585-223-71	Play idler lever ass'y	1	1	1
1-32	82-585-312-01	E-spring, Brake R	1	1	1
1-33	82-585-253-11	Lever, Brake R	1	1	1
1-34	82-585-265-11	Lever, REV	1	1	1
1-35 a	82-585-240-11	Pinch lever ass'y	1	–	1
1-35 b	82-585-364-01	Pinch lever B ass'y	–	1	–
1-36	82-585-296-11	T-spring, Pinch lever	1	1	1
1-37	82-594-234-01	T-spring, Pinch lever A	–	–	1
1-38 a	82-585-254-11	Slide plate, Eject	1	1	–
1-38 b	82-594-215-01	Slide plate, Eject	–	–	1
1-39	82-594-224-11	Fastener M	–	–	1
1-40	82-585-311-01	E-spring, Lid lock	1	1	1
1-41	82-585-279-21	Lever, Eject A	1	1	1
1-42	82-585-278-21	Plate lock	1	1	1
1-43	82-585-317-31	E-spring, Button lock	1	1	1
1-44	82-585-338-01	G cushion, Play lever	1	1	1
1-45	87-031-537-01	Motor screw	1	—	1
1-46 a	87-046-209-01	REC/PB head	1	–	1
1-46 b	87-046-159-01	REC/PB head	–	1	–
1-47 a	87-046-210-01	Erase head	1	–	–
1-47 b	87-046-189-01	Erase head	–	1	–
1-47 c	87-046-196-01	Erase head	–	–	1

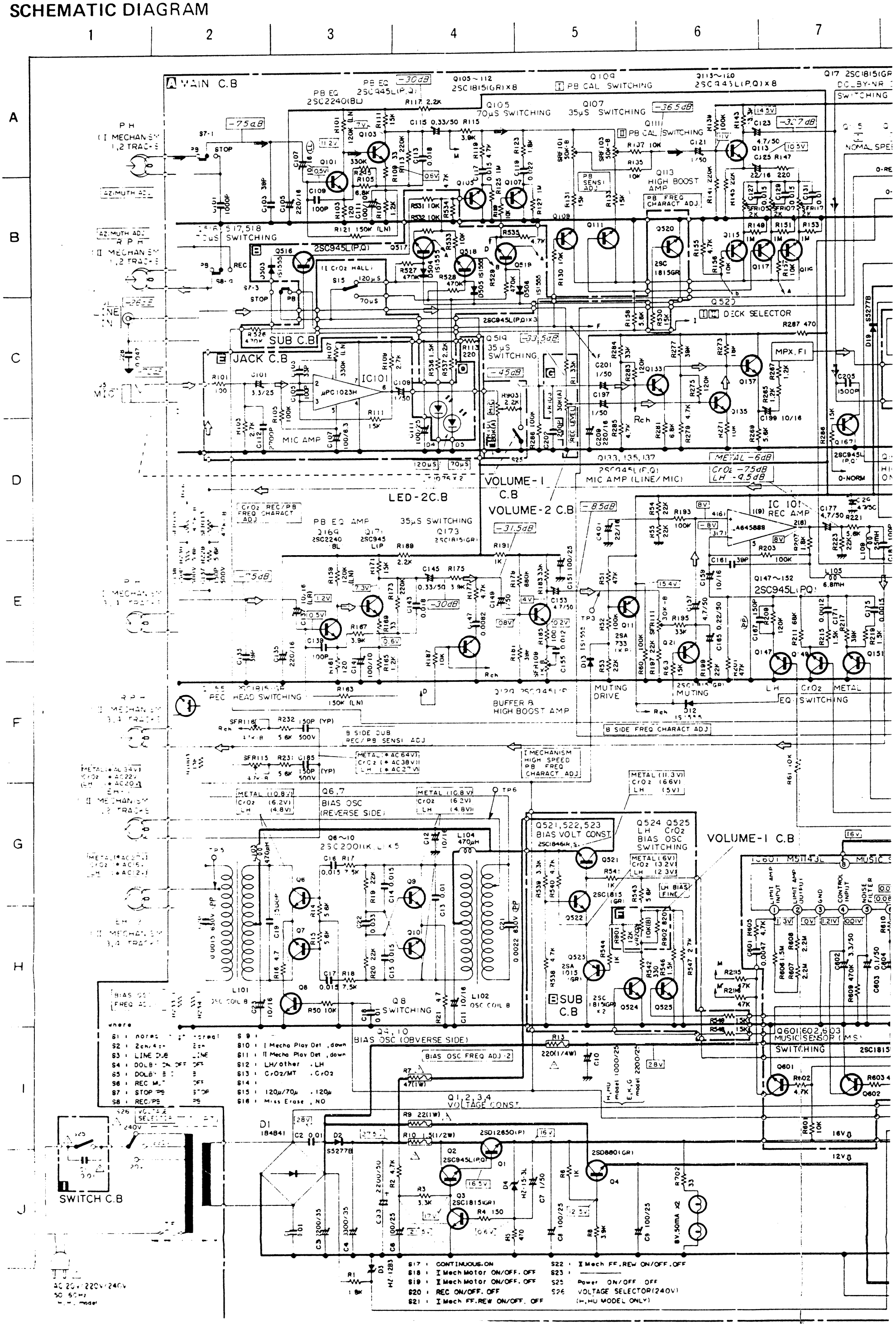
EXPLODED VIEW–2

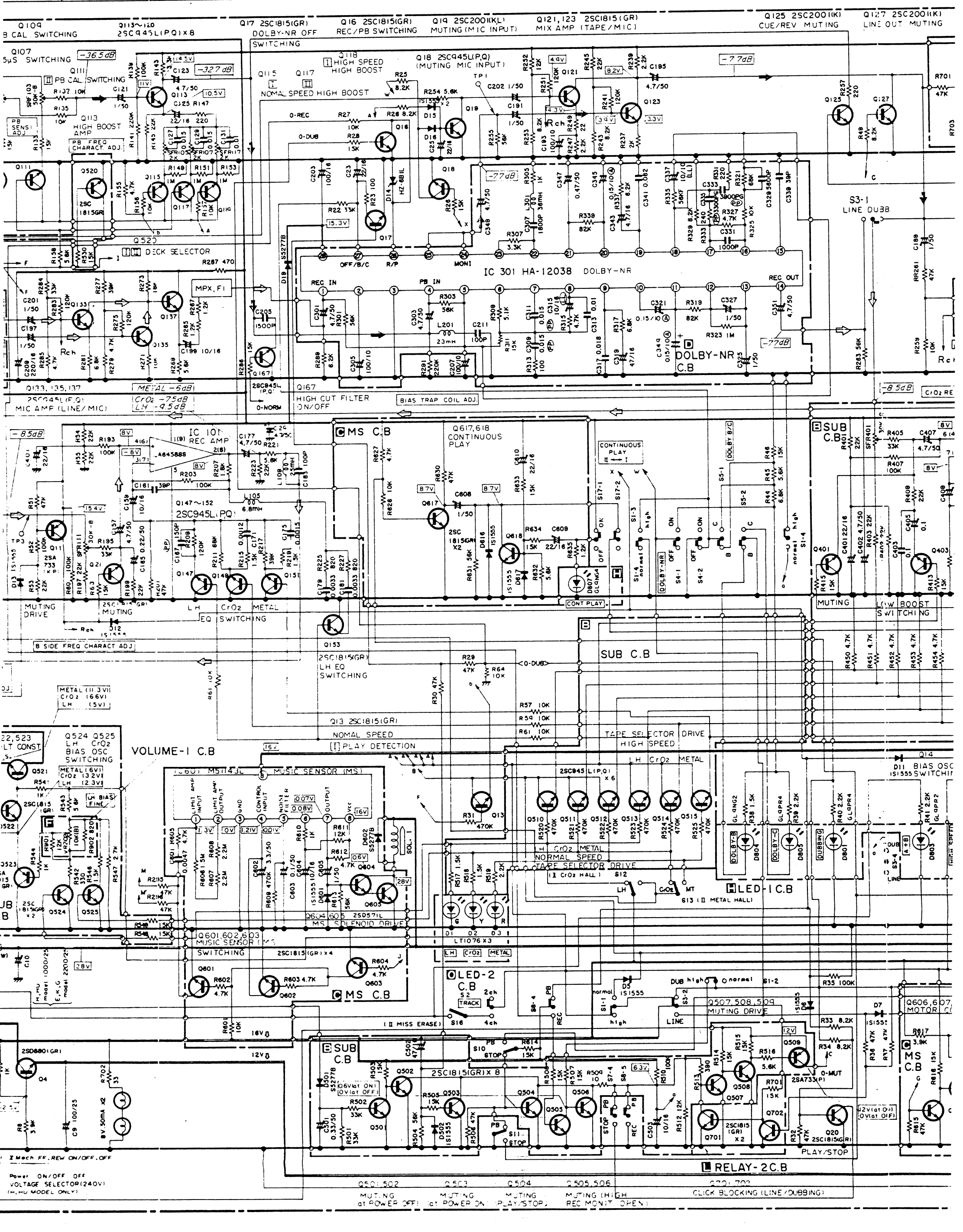


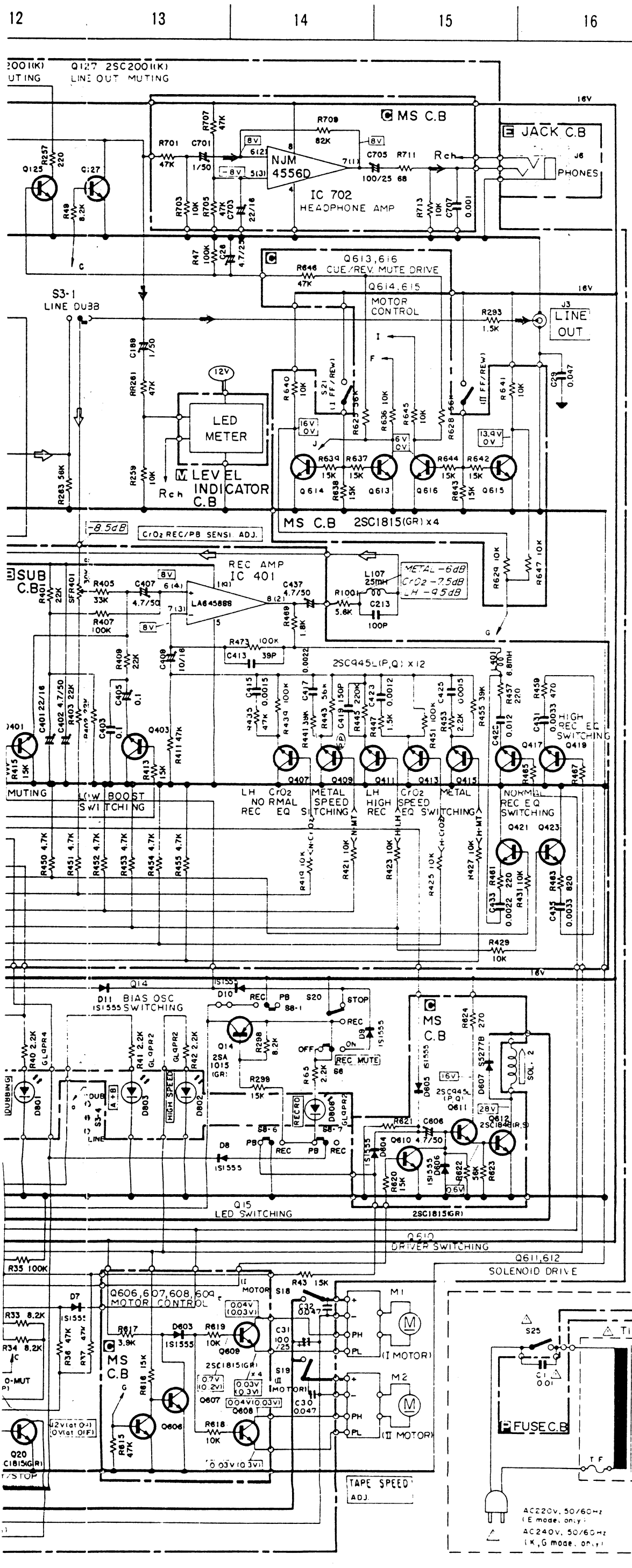
Ref. No.	Part No.	Description	CS-360	CS-770Λ	CS-50
2-1	82-585-384-01	E-spring, REC B	1	1	1
2-2	82-585-267-01	Lever, REC B	1	1	1
2-3	82-585-266-01	Lever, REC A	1	1	1
2-4	82-585-282-11	Slide plate, Meter switch	1	1	1
2-5	82-585-283-01	Slide plate, FR auto	1	1	1
2-6	82-585-306-01	T-spring, Play lever	1	1	1
2-7	82-585-307-01	T-spring, REC lever	1	1	1
2-8	82-585-391-01	Play lever ass'y	1	1	1
2-9	82-585-258-11	Trigger lever, PLAY	1	1	1
2-10	82-585-308-21	E-spring, REW lever	1	1	1
2-11	82-585-260-31	Lever, REW	1	1	1
2-12	82-439-369-11	Slip spring	1	1	1
2-13	82-585-259-11	Trigger lever, REW	1	1	1
2-14	82-585-387-01	Trigger lever, REC B	1	1	1
2-15	82-585-257-11	Trigger lever, FF	1	1	1
2-16	82-585-301-01	E-spring, Trigger PLAY	1	1	1
2-17	82-585-297-01	T-spring, FR lever A	1	1	1
2-18	82-585-264-21	FR lever D	1	1	1
2-19	82-585-263-01	FR lever C	1	1	1
2-20	82-585-298-01	T-spring, FR lever B	1	1	1
2-21	82-585-311-01	E-spring, Lid lock	1	1	1
2-22	82-585-262-21	FR lever B	1	1	1
2-23 a	82-595-204-01	Main belt	1	–	–
2-23 b	82-585-287-11	Main belt	–	1	–
2-23 c	82-594-213-01	Main belt	–	–	1
2-24 a	82-585-378-01	Rubber belt FR C	1	–	–
2-24 b	82-585-336-01	Rubber belt FR B	–	1	1
2-25 a	82-585-368-01	C-spring, Flywheel	1	–	–
2-25 b	82-585-324-11	C-spring, Flywheel	–	1	–
2-25 c	82-176-208-01	C-spring, Flywheel	–	–	1
2-26 a	82-585-375-01	Gear, Flywheel	1	–	–
2-26 b	82-585-243-01	Gear, Flywheel	–	1	1
2-27 a	82-595-227-01	Flywheel ass'y	1	–	–
2-27 b	82-585-229-11	Flywheel ass'y	–	1	–
2-27 c	82-585-367-01	Flywheel ass'y	–	–	1
2-28	82-585-244-01	Gear, Play cam	1	1	1
2-29	82-585-246-01	Gear, Pause cam	1	1	1
2-30	82-585-245-21	Gear, FR cam	1	1	1
2-31	82-585-362-01	Shaft lock B	1	1	1
2-32	82-585-285-11	C-spring, Lock	1	1	1
2-33	82-585-256-21	Trigger lever, PAUSE	1	1	1
2-34	82-585-304-21	T-spring, Trigger Pause	1	1	1
2-35	82-585-327-01	Slide plate key ass'y	1	1	1
2-36	82-585-332-01	E-spring, REC lock	1	1	1
2-37	82-585-203-11	Mechanism chassis B ass'y	1	1	1
2-38	82-175-289-01	E-spring, Slide plate	1	1	1
2-39	82-585-321-41	E-spring, Auto kick	1	1	1
2-40 a	82-585-270-21	Plate auto kick	1	1	–
2-40 b	82-585-359-11	Plate auto kick ass'y	–	–	1
2-41	82-585-269-11	Auto B lever	1	1	1
2-42	82-585-268-01	Auto A lever	1	1	1
2-43	82-585-299-01	T-spring, Auto eject	1	1	1
2-44	82-585-271-01	Auto eject lever	1	1	1
2-45	82-585-248-21	Lever, PAUSE	1	1	1

AD-WX110
H,HU,E,K,G

SCHEMATIC DIAGRAM




Q109 PB CAL SWITCHING
Q110~120 2SC945L(P,Q)x8
Q17 2SC1815(GR) DOLBY-NR OFF
Q16 2SC1815(GR) REC/PB SWITCHING
Q19 2SC2001(KL) MUTING (MIC INPUT)
Q121,123 2SC1815(GR) MIX AMP (TAPE/MIC)
Q125 2SC2001(K) CUE/REV MUTING
Q127 2SC2001(K) LINE OUT MUTING
Q107 5μS SWITCHING
Q111 PB CAL SWITCHING
Q113 HIGH BOOST AMP
Q118 HIGH SPEED HIGH BOOST
Q115 Q117 NOMAL SPEED HIGH BOOST
Q18 2SC945L(P,Q) (MUTING MIC INPUT)
SWITCHING
PB SENS ADJ
PB FREQ CHARACT. ADJ.
DECK SELECTOR
MPX, FI
IC 301 HA-12038 DOLBY-NR
REC IN
PB IN
REC OUT
DOLBY-NR C.B
S3-1 LINE DUB
Q133, 135, 137 2SC945L(P,Q) MIC AMP (LINE/MIC)
METAL -6dB
CrO2 -7.5dB
LH -9.5dB
Q167 HIGH CUT FILTER ON/OFF
BIAS TRAP COIL ADJ.
IC 101 REC AMP
MS C.B
Q617,618 CONTINUOUS PLAY
SUB C.B
MUTING DRIVE
LH CrO2 METAL EQ SWITCHING
Q147~152 2SC945L(P,Q)
Q153 2SC1815(GR) LH EQ SWITCHING
B SIDE FREQ CHARACT ADJ
Q13 2SC1815(GR) NOMAL SPEED PLAY DETECTION
VOLUME-I C.B
Q524 Q525 LH CrO2 BIAS OSC SWITCHING
IC601 M51143L MUSIC SENSOR (MS)
Q601,602,603 MUSIC SENSOR (MS) SWITCHING
Q604,605 2SD571L MS SOLENOID DRIVE
LED-1 C.B
LED-2 C.B
TAPE SELECTOR DRIVE HIGH SPEED
NORMAL SPEED TAPE SELECTOR DRIVE
Q507,508,509 MUTING DRIVE
RELAY-2 C.B
PLAY/STOP
Q50:502 MUTING at POWER OFF
Q503 MUTING at POWER ON
Q504 MUTING (PLAY/STOP)
Q505,506 MUTING (HIGH REC MONIT OPEN)
Q701,702 CLICK BLOCKING (LINE/DUBBING)
Power ON/OFF OFF
VOLTAGE SELECTOR(240V)
(H,HU MODEL ONLY)



NOTES:

1) B (+) power supply
2) Signal path
   Rec path.
3) The voltage is the reference value measured with a tester (20 k-ohms/V DC) when there are no signals.
   But ( ) is with recording.
   An asterisk (*) indicates that the value was measured with a vacuum-tube voltmeter during recording.
4) Resistors with no designation have a rated power of 1/4W and a tolerance of ±5%.
5) Capacitors with no designation have a dielectirc strneght of less than 50WV.
6) The only capacitor tolerances indicated are ±2% (G), ±5% (J) and ±10% (K).
7) Ceramic capacitor symbols:
   High dielectric constant system (YY)
   High dielectric constant system (YW, YP, YZ)
8) Explanation of symbols
   M Mylar capacitor
   PP Polypropylene film capacitor
   BP Bi-polarized capacitor
   LL Low-leakage capacitor
   Fuse resistor
   Nonflammable resistor
   LN Low noise resistor

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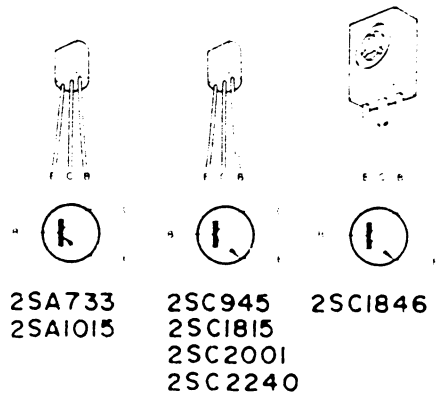
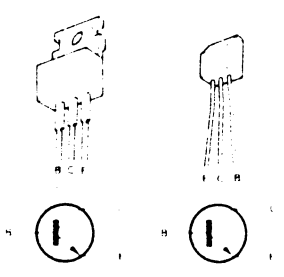


2SA733
2SA1015

2SC945
2SC1815
2SC2001
2SC2240

2SC1846



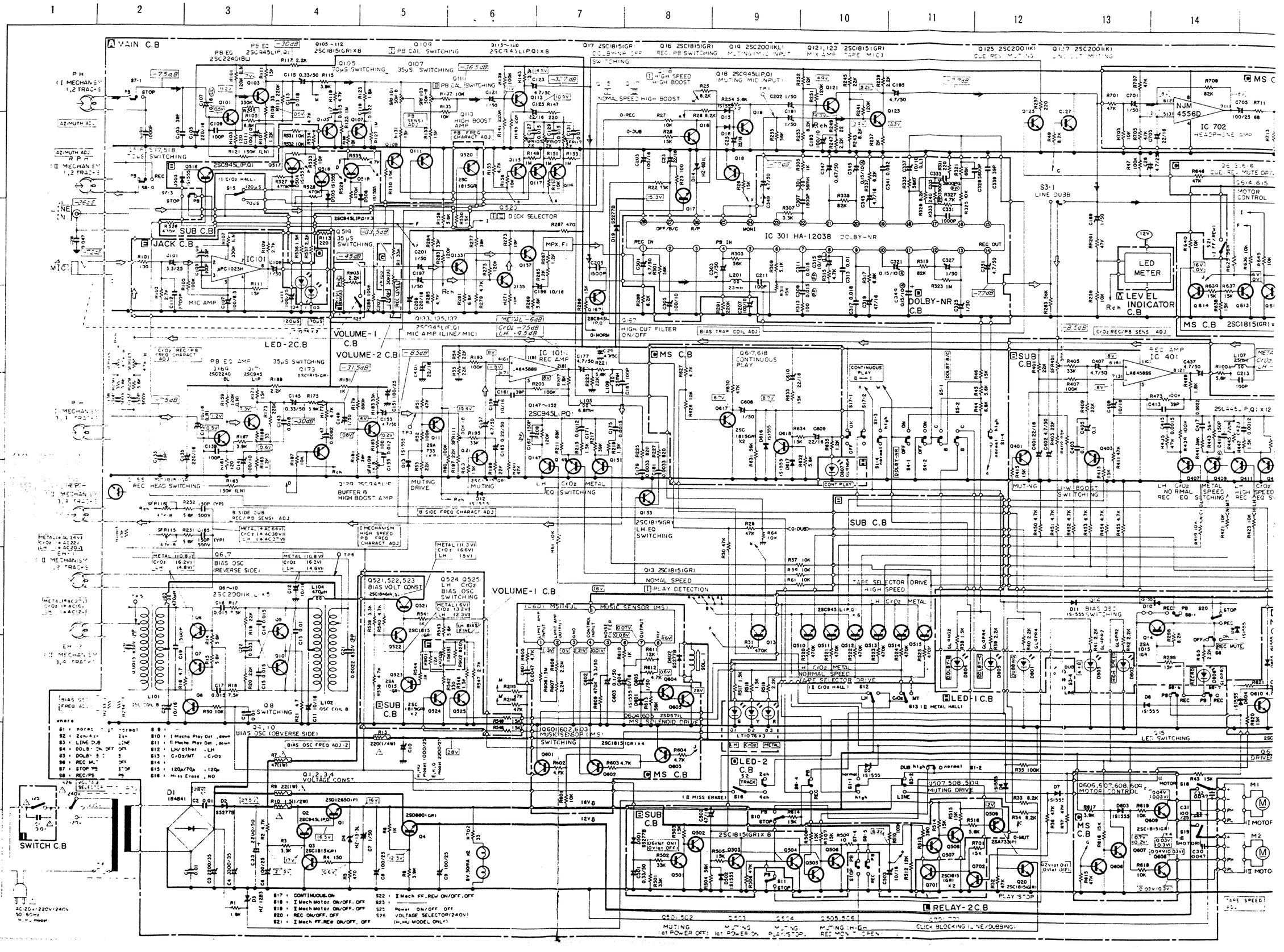
2SD880
2SD1265

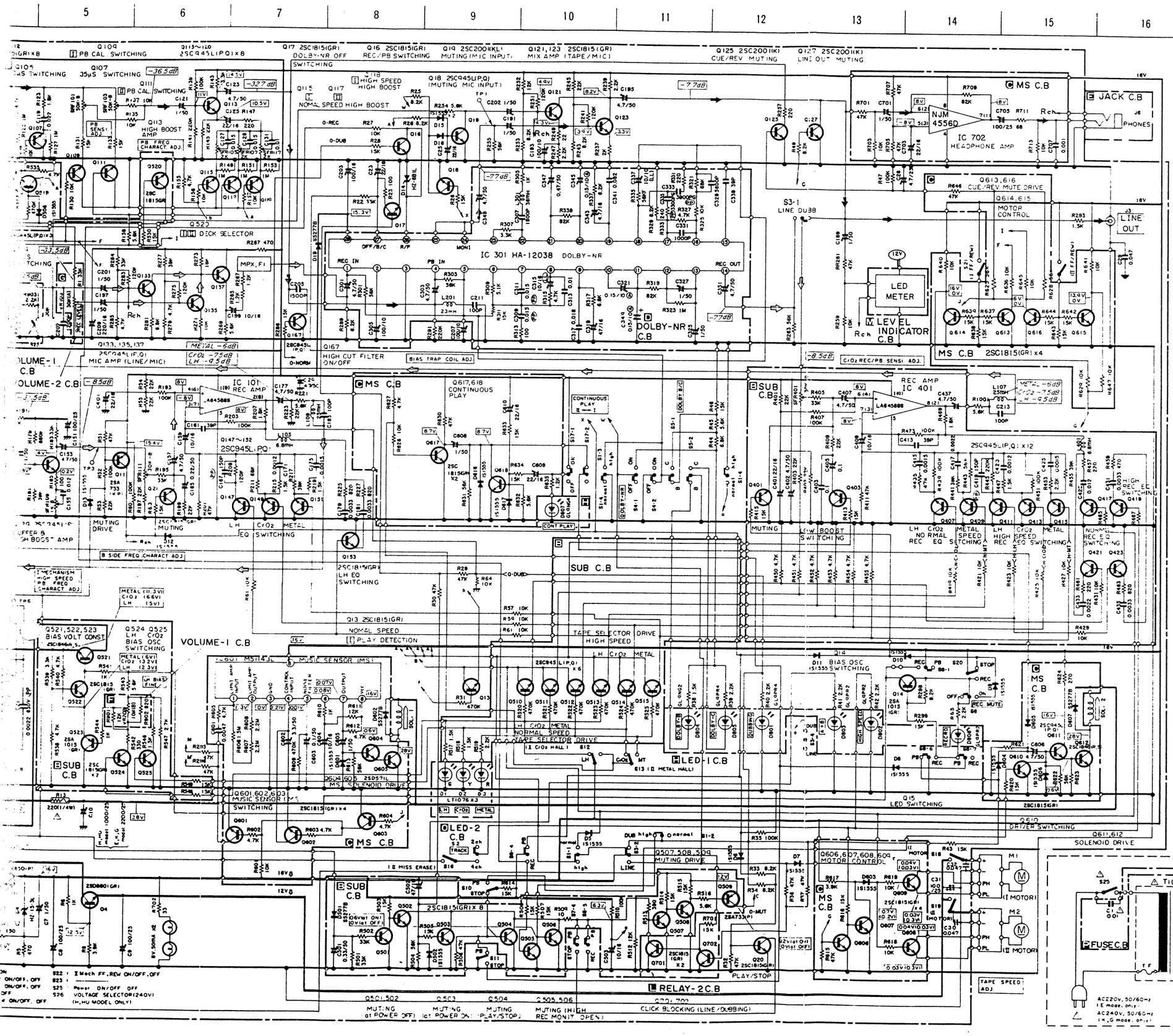
2SD571

AD-WX110
H,HU,E,K,G

AD-WX110
H,HU,E,K,G

SCHEMATIC DIAGRAM





NOTES:

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2) ➡ Signal path
   Rec path.
3) The voltage is the reference value measured with a tester (20 k-ohms/V DC) when there are no signals.
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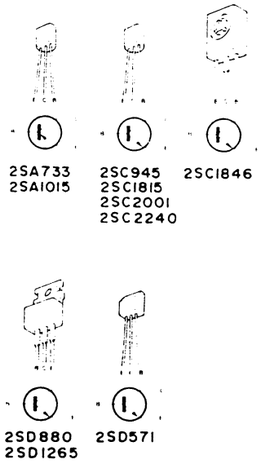
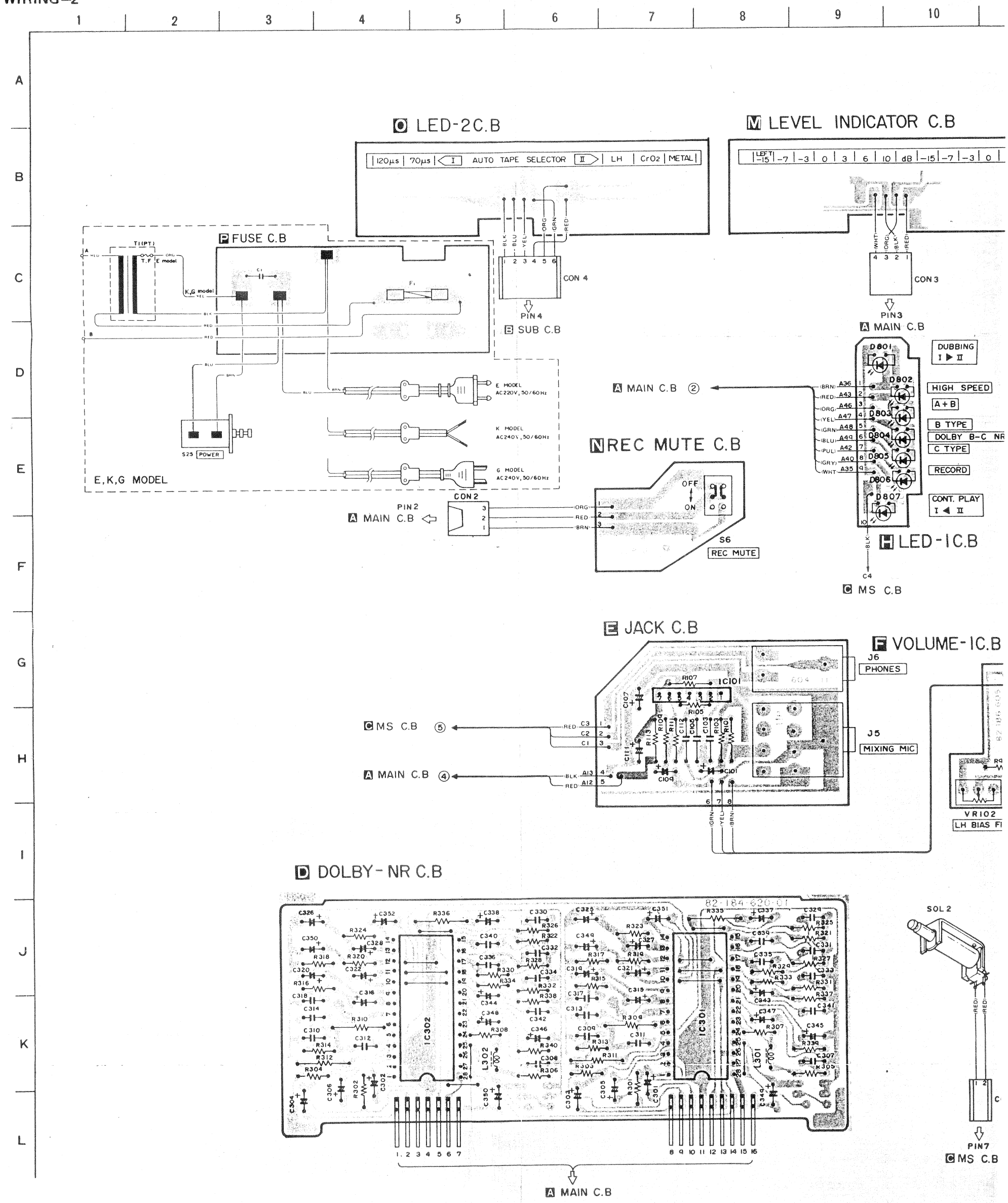


NOTES (1) ▓▓ B(+) Pattern ▒▒ Others pattern
(2) The voltage is the reference value measured with a tester (20 K ohms/V DC) when there are no signals.
An asterisk (*) indicates that the value was measured with a vacuum-tube voltmeter during recording.

WIRING–2



AD-WX110
H,HU,E,K,G

AD-WX110
H,HU,E,K,G

AIWA

9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19

INDICATOR C.B

3 | 6 | 10 | dB | -15 | -7 | -3 | 0 | 3 | 6 | RIGHT 10

(WHT) (ORG) (BLK) (RED)

CON3

PIN3

A MAIN C.B

D801
D802
D803
D804
D805
D806
D807

A36 A43 A46 A47 A48 A49 A42 A40 A35

DUBBING I ▶ II

HIGH SPEED

A+B

B TYPE

DOLBY B-C NR

C TYPE

RECORD

CONT. PLAY I ◀ II

H LED-I C.B

C4

C MS C.B

B SUB C.B ③

A MAIN C.B ①

F VOLUME-I C.B

J6 PHONES

J5 MIXING MIC

B3 B2 B1

R901 R903 R902

A38

VR102 LH BIAS FINE

VR101 MIC VOLUME

L RELAY-2C.B

CON8
C MS C.B

11 10 9 8 7 6 5 4 3 2 1

PIN8

Q701 Q702

R701 R702

C31 C32

S18 (I MOTOR)

M1 (I MOTOR)

SFR2 SFR1

S10 (I PLAY DET)

S21 (I FF/REW)

SOL 1

YEL → B4 B SUB C.B

WHT → A21

WHT ← A31

PUL

WHT

WHT → A23

PL1 PL2

A MAIN C.B

S15 (I CrO2 HALL DET)

CON5

PIN5
B SUB C.B

K RELAY-I C.B

CON9
C MS C.B

CON10
A MAIN C.B

PIN9 PIN10

S20 (RECORD)

M2 (II MOTOR)

SFR4 SFR3

S11 (II PLAY DET.)

S22 (II FF/REW)

S19 (II MOTOR)

SOL 2

S12 (II CrO2 HALL DET)

S13 (II METAL HALL DET.)

CON7

CON6

PIN7
C MS C.B

PIN6
B SUB C.B

S16 (II MISS ERASE)

CON1

PIN1
A MAIN C.B

2. Tape Speed Adjustment

Settings: • DUBBING switch: ON
• Test point: TP1 (L-ch), TP2 (R-ch)

	Double speed	Standard speed
Test tape	TTA-111H	TTA-111S
SPEED	HIGH	NORMAL
Position to be adjusted (Mechanism I)	SFR-1	SFR-2
Position to be adjusted (Mechanism II)	SFR-3	SFR-4

Method: (Mechanism I)
- HIGH: Load a TTA-111H, set the unit to the play mode and then set the SPEED switch to HIGH. Adjust SFR1 so that the speed is +0.5%.
- NORMAL: Load a TTA-111S, set the unit to the play mode and then set the SPEED switch to NORMAL. Adjust SFR2 so that the speed is +0.5%.

(Mechanism II)
- HIGH: Load a TTA-111H, set the unit to the play mode, and set the SPEED switch to HIGH. Adjust SFR3 so that the speed is ± 0%.
- NORMAL: Load a TTA-111S, set the unit to the play mode and then set the SPEED switch to NORMAL. Adjust SFR4 so that the speed is ± 0%.

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WIRING–1

7. CrO_2 REC/PLAY Sensitivity Adjustment
- Adjustment locations: SFR401 (L-ch)
  SFR402 (R-ch)

Method: Perform adjustment same as in Item 6. REC/PLAY frequency characteristic adjustment, and adjust the recording current so that the play output of mechanism I is +0.5 ± 2dB to the output of mechanism II.

9. B side Dubbing REC/PB Sensitivity Adjustment
- Test tape: (Mechanism I) TTA-161
  (Mechanism II) TTA-119G
- Adjustment locations: SFR111 (L-ch)
  SFR112 (R-ch)

Method: Perform adjustment same as in Item 8. B side dubbing frequency characteristic adjustment, and adjust the recoreding current so that the LINE OUT output is 530mV ± 0.3dB when the recorded section is played back with I deck.

8. B side Dubbing Frequency Characteristic Adjustment
- DUBBING switch: ON ← OFF
- SPEED switch: HIGH
- TRACK switch: A + B
- Test tape: (Mechanism I) TTA-117E
  (Mechanism II) TTA-119G

Method: Load a test tape and dubbing the 1kHz/10kHz signal. Take out TTA-119G loaded to Mechanism II without rewinding it, turn it over and load to Mechanism I. Set the DUBBING switch to OFF and adjust the bias current so that 1kHz/10kHz is set to 0 ~ +0.5dB when TTA-119G loaded to Mechanism I is played back.

11. Bias OSC. Frequency Adjustment-1
- Test point: TP5
- Adjustment location: L101

Method: Adjust L101 so that the voltage of test point becomes maximum.
Rating: Bias OSC Frequency: 100kHz

TP5	Bias OSC Frequency Test Point-1
TP3	B side PB Output (L-ch)
TP4	B side PB Output (R-ch)

5. Mechanism I High Speed PB Frequency Characteristic Adjustment
- Test tape: TTA-117E
- DUBBING switch: ON
- SPEED switch: HIGH
- TRACK switch: (A side) A or B, (B side) A + B
- Test point: (A side) LINE OUT
  (B side) TP3 (L-ch), TP4 (R-ch)
- Adjustment locations: (A side) SFR117 (L-ch)
  SFR118 (R-ch)
  (B side) SFR109 (L-ch)
  SFR110 (R-ch)

Method: Load a test tape to Mechanism I and set Mechanism II to the play mode. Adjust so that output of 10kHz signal is 0 ± 0.3dB based on the output at the test point as 1kHz.

6. CrO_2 REC/PB Frequency Characteristic Adjustment
- Test tape: TTA-119G
- Input signal: LINE IN, 1kHz/12.5kHz
- Test point: LINE OUT
- Adjustment locations: SFR113 (L-ch)
  SFR114 (R-ch)

Method: Set Mechanism II to the recording mode and adjust the REC VR so that the LINE OUT output is 44mV (–25dBm). Next, receive the 1kHz/12.5kHz signal, and adjust the bias current so that 1kHz/12.5kHz is set to ± 0.5 ± 0.3dB when the recorded section is played back with Mechanism I.

12. Bias OSC. Frequency Adjustment-2
- Test point: TP6
- Adjustment location: L102

Method. Adjust L102 so that the frequency becomes 100kHz.

TP6	Bias OSC Frequency Test Point-2

4. PB Frequency Characteristic Adjustment
- Test tape: TTA-117E
- DOLBY-NR switch: OFF
- Test point: LINE OUTPUT
- Adjustment locations: (Mechanism I) SFR105 (L-ch)
  SFR106 (R-ch)
  (Mechanism II) SFR107 (L-ch)
  SFR108 (R-ch)

Method: Play back the test tape and adjust Mechanisms I and II is the same way so that the output of 10kHz is + 1.0 ± 0.3dB based on the 1kHz output.

3. PB Sensitivity Adjustment
- Test tape: TTA-161
- DOLBY-NR switch: OFF
- Test point: LINE OUT
- Adjustment locations: (Mechanism I) SFR101 (L-ch)
  SFR102 (R-ch)
  (Mechanism II) SFR103 (L-ch)
  SFR104 (R-ch)

Method: Adjust so that the LINE OUT output is set to 540mV in Mechanism I and 550mV in Mechanism II. The output in Mechanism I drifts when Mechanism II is adjusted, so repeat adjustment alternately.

10. Bias Trap Coil Adjustment
- DUBBING switch: ON
- SPEED switch: HIGH
- TRACK switch: A + B
- Test point: LINE OUT
- Adjustment locations: L201 (L-ch)
  L202 (R-ch)

Method: Load a METAL tape to Deck II, set it to the recording mode and stops Mechanism I. Adjust so that bias leakage to LINE OUT is minimum at that time.
Caution: Load the test tape so that the side with the label attached is set to the mechanism side when using track B of the test tape.
Track A : Front side
Track B : Rear side

TP1	Tape Speed Test Point (L-ch)
TP2	Tape Speed Test Point (R-ch)

1. Azimuth Adjustment Settings:
- Test tape: TTA-117E
- Adjustment location:
  Azimuth adjustment screw

B SUB C.B

EH-2 (II MECANISM)

S5 DOLBY B/C

S4 DOLBY-NR

R.P.H (II MECANISM)

EH-1 (II MECANISM)

P.H (I MECANISM)

F VOLUME-I C.B

H LED-IC.B

A MAIN C.B

NOTES (1) ■ B(+) Pattern ■ Others pattern

(2) The voltage is the reference value measured with a tester (20 K ohms/V DC) when there are no signals.
An asterisk (*) indicates that the value was measured with a vacuum-tube voltmeter during recording.

9 10 11 12 13 14 15 16 17 18 19

J DECK SELECTOR C.B

C MS C.B

S17 CONTINUOUS PLAY II → I

E JACK C.B ⑤

H LED-I C.B

F VOLUME-I C.B ③

RELAY-2 C.B

K RELAY-I C.B PIN9

CON9

CON8

L RELAY-2 C.B PIN8

CON10

K RELAY-I C.B PIN10

L RELAY-2 C.B

J2 LINE IN R

J1 LINE IN L

J3 LINE OUT L

J4 LINE OUT R

E JACK C.B ④

D DOLBY-NR C.B

VR103 REC LEVEL

S1 SPEED NOR — HIGH

S2 TRACK A or B → A+B

S3 DUBBING OFF(LINE) — DUBBING

H, HU MODEL 50/60Hz AC120V/220V/240V

T1(P.T) T.F

H, HU model

I SWITCH C.B

S25 POWER

S26 VOLTAGE SELECTOR

H, HU MODEL